

*Archives of* Medical Library  
**PHYSICAL THERAPY**

*Official Journal American Congress of Physical Therapy*



**EDITORIAL BOARD**

WALTER M. SOLOMON, M.D.  
Cleveland, Ohio.  
(On leave of absence, Army U. S.)

EARL C. ELKINS, M.D.,  
Rochester, Minn.

FRED B. MOOR, M.D.,  
Los Angeles, Calif.

RICHARD KOVACS, M.D.  
New York, N. Y.

ARTHUR L. WATKINS, M.D.,  
Boston, Massachusetts.  
(Interim appointment.)

JOHN S. COULTER, M.D.  
Chicago, Ill.

**23rd Annual Session**  
**AMERICAN CONGRESS OF PHYSICAL THERAPY**

September 6, 7, 8, 9, 1944

HOTEL STATLER

CLEVELAND, OHIO

Volume XXV

APRIL, 1944

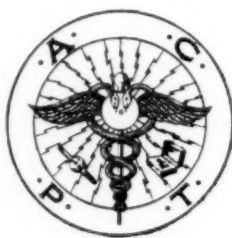
No. 4

# AMERICAN CONGRESS OF PHYSICAL THERAPY

## 23rd ANNUAL SCIENTIFIC and CLINICAL SESSION

September  
6, 7, 8, 9  
1944

Hotel Statler  
Cleveland,  
Ohio



Rehabilitation is in the spot light today—Physical Therapy plays an important part in this work. Hear how Physical Therapy is used by the armed services and its application in the industrial injured to speed up recovery. Attend this important session—Sept. 6, 7 and 8, 1944.

The instruction course will stress the clinical application of Physical Therapy. Plan to attend these instructive lectures.

Special clinics will be held in Hospital Physical Therapy Departments, Saturday Sept. 9, 1944.

EXECUTIVE OFFICES

30 NORTH MICHIGAN AVENUE

CHICAGO 2, ILLINOIS

# Contents—Apr. 1944

Volume XXV

No. 4

## ARCHIVES OF PHYSICAL THERAPY

30 North Michigan Avenue, Chicago 2, Illinois

Original contributions, exchanges and books for review should be forwarded to the Editorial Office. All business matters including advertising should be handled through the Executive Office, 30 N. Michigan Ave., Chicago 2, Illinois. The statements in the manuscripts published in the ARCHIVES OF PHYSICAL THERAPY, are made solely on the responsibility of the author. The American Congress of Physical Therapy does not assume any responsibility for statements contained therein. Manuscripts accepted for publication in ARCHIVES OF PHYSICAL THERAPY, are for exclusive publication and may not be published elsewhere.

### OFFICERS

#### American Congress of Physical Therapy

KRISTIAN G. HANSSON, M.D.,  
New York, N. Y., President.  
MILAND E. KNAPP, M.D.,  
Minneapolis, President-Elect.  
WALTER S. McCLELLAN, M.D.,  
Saratoga Springs, N. Y.,  
First Vice-President.  
\*H. WORLEY KENDELL, M.D.,  
Chicago, Second Vice-President.  
\*KENNETH PHILLIPS, M.D.,  
Miami, Florida, Third Vice-President.  
\*O. LEONARD HUDDLESTON, M.D.,  
Denver, Colo., Fourth Vice-President.  
EARL C. ELKINS, M.D.,  
Rochester, Minnesota, Fifth Vice-President.  
RICHARD KOVACS, M.D.,  
New York, Secretary.  
JOHN S. COULTER, M.D.,  
Chicago, Treasurer.  
WALTER J. ZEITER, M.D.,  
Cleveland, Executive Director.  
MARION G. SMITH, B.Sc.,  
Chicago, Executive Secretary.

### EXECUTIVE COUNCIL

Fred B. Moor, M.D., Los Angeles, *Chairman*.  
\*Norman E. Titus, M.D., New York, N. Y.,  
*Secretary*.  
William Bierman, M.D., New York, N. Y.  
John S. Coulter, M.D., Chicago.  
James C. Elsom, M.D., Madison, Wisconsin.  
Frank H. Ewerhardt, M.D., St. Louis, Missouri.  
Roy W. Fouts, M.D., Omaha, Nebraska.  
John Severy Hibben, M.D., Pasadena, Calif.  
Abraham R. Hollender, M.D., Chicago.  
Disraeli Kobak, M.D., Chicago.  
Frank H. Krusen, M.D., Rochester, Minnesota.  
Nathan H. Polmer, M.D., New Orleans.  
William H. Schmidt, M.D., Philadelphia.  
Frederick L. Wahrer, M.D., Marshalltown,  
Iowa.  
Kristian G. Hansson, M.D., New York, N. Y.,  
Ex-Officio.

### EDITOR EMERITUS

DISRAELI KOBAK, M.D.,  
Chicago.

\* In Active Service.

Subscription — In the United States, its possessions, and Mexico, \$5.00 yearly; Canada, \$5.50; elsewhere, \$6.50 the year. Advertising rates on application. All advertising copy subject to acceptance by publication committee. Published monthly at Chicago, Illinois, by American Congress of Physical Therapy. Entered as Second Class Matter, January 29, 1938, at the Post Office at Chicago, Illinois, under the Act of March 3, 1879.

### ORIGINAL ARTICLES

Baruch Committee on Physical Medicine.....	199
Mechanics in Relation to Derangement of the Facet Joints of the Spine.....	Jessie Wright M.D. 201
Fever and Sulfadiazine Therapy in Resistant Gonorrhea.....	Capt. Sidney Licht, M.C., A.U.S., and Major Vernon Dick, M.C., A.U.S. 207
Histamine Ion Transfer, A Five Year Evaluation.....	Irvin F. Hummon, Jr., M.D. 212
Flexibility of Healthy Children.....	A. D. Gurewitsch, M.D., and Margaret A. O'Neill, M.A. 216
Physical Medicine in Neuropsychiatric Diseases with Special Reference to Veterans Administration Beneficiaries.....	A. B. C. Knudson, M.D. 222
Editorials .....	227
Correspondence .....	230
Special Article—The Story of the Kenny Method.....	Basil O'Connor 231
Medical News .....	235
Book Reviews .....	242
Physical Therapy Abstracts.....	247

### EDITOR OF MONTH

EARL C. ELKINS, M.D.

Rochester, Minnesota

## MEETINGS OF PHYSICAL THERAPY ORGANIZATIONS

In these columns will be published information about meetings of physical therapy organizations. New data should be sent promptly to the office of the Secretary, 2 E. 88th St., New York 28, N. Y.

*American Congress of Physical Therapy*, 23rd Annual Session, Hotel Statler, Cleveland, September 6, 7, 8, 9, 1944; **Instruction Course** to be held during the meeting; Dr. Richard Kovács, 2 East 88th Street, New York 28, Secretary. See announcement elsewhere this issue.

*Midwestern Section, American Congress of Physical Therapy*, Detroit, Michigan, (tentative date), Wednesday, May 31st, 1944. Dr. M. K. Newman, 10 Peterboro St., Detroit, Michigan, Chairman. Detailed announcement in May issue.

*New York Physical Therapy Society*; meetings on first Wednesdays, from October to May, New York City; Dr. Madge C. L. McGuinness, 1211 Madison Avenue, New York 28, Secretary.

*Kings County Medical Society, Physical Therapy Section*; meetings at 1313 Bedford Avenue, Brooklyn, bi-monthly on second Thursdays; Dr. Samuel A. Warshaw, 1373 Ocean Parkway, Brooklyn, N. Y., Secretary.

*New England Society of Physical Medicine*, meetings at Hotel Kenmore, Boston, on third Wednesday from October to June; Dr. William McFee, 41 Bay State Road, Boston 15, Mass.

*The Penna. Academy of Physical Medicine*; meeting at the Phila. County Medical Building, 21st and Spruce Streets, third Thursday, alternate months; Dr. Harold Lefkoe, 1824 Spruce Street, Philadelphia 3, Secretary-Treasurer.

*American Physiotherapy Association*, 22nd Annual Conference, Hotel Pennsylvania, New York City, May 17 to 21, 1944. Evelyn Anderson, 5 Rico Way, San Francisco, Calif., Secretary.

*National Council on Rehabilitation*, annual meeting Carlton Suite, Ritz-Carlton Hotel, Madison Avenue and 45th Street, New York City, 9:30 A.M. to 4:30 P. M., June 5 and 6, 1944. Secretary, Holland Hudson, 1790 Broadway, New York 19, N. Y.

## No other medical periodical gives you such "wide coverage" in the physical therapy field as THE ARCHIVES

If you are a teacher in physical therapy, a research worker, a physicist, or just a clinician—if you want to stay abreast of all that is new in physical therapy—you must read THE ARCHIVES.

Each month you will find in this journal informative articles, constructive editorials, physical therapy news, announcement of new books and a wealth of abstracted material dealing with every phase of physical medicine.

AMERICAN CONGRESS OF PHYSICAL THERAPY,  
30 No. Michigan Ave., Chicago 2.

Please find enclosed check for \$5 ☐ or bill me ☐  
for one year's subscription to the ARCHIVES.

Name.....

Address.....

City and State.....

\* If you are not a subscriber to THE ARCHIVES—send in your subscription today. Sample copy will be sent on request. Subscription price \$5 per year; Foreign \$6.50.



## BARUCH COMMITTEE ON PHYSICAL MEDICINE

*[The following is a copy in part of the official announcement of the gift of Mr. Bernard M. Baruch. It was felt to be of sufficient importance to warrant the delay in sending out this issue of the ARCHIVES. The make-up of the issue was replanned to include the announcement. — Ed.]*

After a scientific exploration of the possibilities of the subject, with special reference to its value in the rehabilitation of the wounded and ill men, discharged from the Armies—Casualties of the war—Bernard M. Baruch yesterday (April 26, 1944) gave the sum of \$1,100,000 to be used for the teaching of and research into physical medicine. An administrative board with Dr. Ray Lyman Wilbur, Chancellor of Stanford University, as Chairman, has been established to inaugurate the program.

The following institutions are participating:

1. To Columbia University College of Physicians and Surgeons Medical School, \$400,000 for the establishment of a key center of research and teaching of Physical medicine, with particular reference to its application for returning veterans. This sum is to be expended over a ten year period. This center is to give immediate assistance in maintaining an adequate supply of medical specialists to handle the problems of war and post-war rehabilitation.

2. To New York University College of Medicine, \$250,000 to be spent in ten years in establishing a center for teaching and special research in preventive and manipulative structural mechanics in physical medicine.

3. To the Medical College of Virginia (of which the late Dr. Simon Baruch, father of Bernard M. Baruch, was a student) \$250,000 to be expended in ten years in establishing a center for teaching and research with particular reference to Hydrology, Climatology and Spa therapy.

4. To selected medical schools, \$100,000 to develop an immediate program for the physical rehabilitation of war casualties and those injured in industry.

5. For the establishment of Fellowships or Residencies \$100,000 to be used for the benefit of qualified physicians who are selected to be trained in this field.

Mr. Baruch's gift was animated by the belief that physical medicine has not been given the scientific treatment it deserves. Physical medicine means the treatment of disease by external physical agents including light, water, heat, electricity and other mechanical agents including exercise and massage. Hydrology (the science treating of water, with particular reference to its curative properties); Climatology (specifically particular climates to help cure particular ailments); and Spa-therapy (the external and internal use of water at a health resort for curative purposes) are included in the subject.

To be sure of the ground which he wished to cover, Mr. Baruch as long ago as last October, asked Dr. Ray Lyman Wilbur, himself a distinguished physician and Chancellor of Stanford University, to act as chairman of a

committee for the purpose of determining the soundness of the plan and the best method of approach.

Mr. Baruch, explaining to Dr. Wilbur's committee that they were free to report the truth as they found it, said his interest in the situation had arisen from two causes:

1. Because his father, a distinguished surgeon of the Confederate Army, Dr. Simon Baruch, had been a leader in the field at the College of Physicians and Surgeons, and

2. Because of his (Mr. Baruch's) desire to do something for the sick, especially the ill and wounded veterans. The Committee after many meetings recommended the grants which were distributed yesterday (April 26, 1944).

In making these gifts, the donor, under the guidance of his committee, asked that each of the centers "Provide itself with an adequate team of workers among whom will be a specialist in clinical physical medicine and an appropriately trained and interested laboratory scientist." It is expected that this team will coordinate all work of the centers and gather others in the institution so that an effective group will be developed.

The underlying idea of the gift was expressed in a letter Mr. Baruch wrote to Dr. Wilbur. This letter read in part as follows:

October 11, 1943.

My dear Dr. Wilbur:

My father, Dr. Simon Baruch, impressed me with the possibilities of physiotherapy as a preventive and as a cure for human ills. Later on Dr. James suggested a school for physiotherapy to be established which, after study, would cull the best from hydrotherapy, balneology, sun, heat, cold, electricity, air and Swedish therapy, massage, chiropractics, osteopathy, exercise and allied curative means.

I have asked you to serve as Chairman of a Committee to make a survey of the field of physiotherapy and make such recommendations as you and your committee think would widen its usefulness. In view of the many wounded, I know you will give special consideration to reconstruction and occupational therapy.

May I suggest also that you give as much thought as you can in consultation with such authorities as Dr. Coolidge of Schenectady, to the matter of electronics and its possibilities in the field of medicine? . . . .

I am deeply grateful to you and your associates for your willingness to accept this worthwhile undertaking.

Sincerely yours,

(SGD) BERNARD M. BARUCH.

Dr. Ray Lyman Wilbur, Chancellor  
Stanford University  
California

With the Baruch donations and the preparation of its final report, which will be distributed in a few days, the committee ceases to function. An

administrative board has been formed under the chairmanship of Dr. Ray Lyman Wilbur with Dr. Frank H. Krusen as director and the affiliation of Miss Mary A. Boyle, a long time associate of Mr. Baruch. Offices have been established at 597 Madison Avenue, Room 3600, New York City, which are in charge of Miss Grace Keefe as executive secretary. A scientific advisory committee and a committee on war and post-war physical rehabilitation are being formed. Dr. Morris Fishbein of the American Medical Association is a member of the Committee on Public Relations, together with Dr. Wilbur, Dr. John S. Coulter, Dr. Krusen, L. C. Salter, and Herbert Bayard Swope.

---

## MECHANICS IN RELATION TO DERANGEMENT OF THE FACET JOINTS OF THE SPINE \*

JESSIE WRIGHT, M.D.

PITTSBURGH

In 1871 Wharton P. Hood, M.D., M.R.C.S., furnished *Lancet* with a description of bone setting as demonstrated to him by a bone setter, Mr. Hutton, who felt indebted to Wharton Hood's father, Dr. Peter Hood, for special professional services. Dr. Wharton Hood noted that bone setting was done without accurate knowledge of anatomy or physiology but nevertheless was surprisingly effective. He suggested to his medical colleagues that much greater success should follow if the manipulator were an experienced physician with a background in anatomy, physiology, pathology and diagnosis. His attention was directed chiefly to bone setting to relieve intra-articular adhesions or muscular tension.

Various pathologic states produce abnormal sounds in or about joints, or abnormal joints give forth sounds other than those recognized as coming from normal joints. The breaking of adhesions between articular surfaces produces a sound like that made by the breaking of a green stick, fibers breaking individually as the force increases. Synovial adhesions, such as are common in the facet joints, may be from slight injury followed by disuse. Any injury sufficient to result in efforts at repair during a period of rest may lead to adhesions. Voluntary movement is limited by these adhesions and surrounding tissues shorten to accommodate themselves to the restricted range. Such adhesions may occur in facet joints which are well but which have been immobilized while a nearby lesion healed. Such pathologic change results, obviously, in altered mechanics with clinical symptoms and signs. Quick, forceful movements in the direction of normal joint motion may result in a snap, or a ripple of pops as adhesions are broken, after which the joint may be moved through its normal range or the manipulation repeated without repetition of the sound. This is in direct contrast to the reduction of a subluxation causing a click which may be repeated if the subluxation recurs, but not if reduction and normal range of motion result. The sound accompanying the reduction of a subluxation of facet joints may be explained by the sudden readjustment of joint surfaces between which synovial fluid has become thickened and viscid. Bringing about

---

\* Read at the Twenty-second Annual Session of the American Congress of Physical Therapy, Chicago, September 15, 1943.

a greater area of contact aligns the unevenly opposed surfaces often with an audible click or palpable settling although no irregularity of surface has been encountered.

Certain subluxation of facets may be reduced by simply putting the part of the spine through a complete range of motion. Or, if not too long standing, a subluxation may be reduced gradually by improvement of posture and body mechanics or by strapping if the pull is in the proper direction. Sometimes a quick thrust or sudden, controlled traction may be necessary to overcome tension outside the joint in periarticular structures or muscles which resist the natural tendency for reapposition of joint surfaces to occur immediately after subluxation.

Although mechanical derangements of the spine are not ignored by the medical profession so universally as they were in past decades, a consideration of them is not included as a part of any adequate physical examination. Too often we still hear otherwise capable physicians speak disparagingly of subluxation of facet joints and treatment by appropriate physical measures, including manipulation. Those of us interested in physical medicine will do well to heed Hippocrates' advice, "Science begets knowledge; opinion, ignorance." We deplore the procedures of nonmedical manipulators and rightly so when they proceed to treat discomfort in the back without preliminary examination, diagnosis and consideration of all available means of giving relief. But we should not jump to the conclusion that all such ideas are without scientific basis. It may be most important for the physician to recognize and deal with congenital anomalies, tuberculosis and other infections of the spine, fracture, dislocation, arthritis, cancer and complaints centered in the back but referable to nerve or visceral lesions; but a great number of patients are more concerned about causes of nagging or irritating aches and pains which do not primarily endanger health or life but which interfere with normal activity or feeling of well-being. Under such headings come subluxation, compression, adhesions or other derangement of facet joints in the spine.

### Anatomy and Physiology

Before derangements are discussed, a brief review of the anatomy and physiology of the facet joints of the spine is in order. There are two forms of joints between bones of the vertebral column; (1) synarthroses between the spinous and transverse processes, between the laminae and between the vertebral bodies, and (2) diarthroses between the articular processes. The articular capsules of the facet joints are composed partly of white fibrous tissue and partly of yellow elastic tissue. In the cervical region the medial side of the capsules is formed by the ligamenta flava. The articular capsules in the cervical region are most lax, those in the lumbar region are tighter and those in the thoracic region are tightest in the normal spine. Were it not for the articular processes, the vertebral column, instead of being steady, endowed with possible movement by muscles, would be unstable, requiring greater expenditure of muscular effort to steady it. Flexion and extension are free in the lumbar region, and a certain amount of lateral movement is permitted by the separation of the articular facets which are not in close apposition. Movements in the cervical and dorsal regions are influenced by the axis and facing of the facet joints. The cervical articular processes and their facet joints in an oblique plane allow movements of flexion, extension and combined side bending with rotation. The thoracic articular facets are set vertically on the arc of a circle with the axis anterior to the vertebral bodies, which allows rotation and forward gliding of facets on each other.

The ligamenta flava have certain important functions in relation to the facet



joints. These yellow ligaments restore the articular facets to their normal position with regard to each other after movement of the spinal column. By forming the median portion of each articular capsule, they take the place of muscle in preventing the capsule from being nipped between the articular surfaces during movement.

The synovial lining of the capsules is furnished with a rich network of fine vessels. Articular veins drain the structures supplied by the articular arteries. Lymph vessels form networks in the capsules. There is extensive nerve distribution to the synovial layer of the capsule, the endings being in the form of pacinian corpuscles. These nerves are in part vasomotor, but chiefly proprioceptive fibers of afferent elements. Hilton's law states that the trunk of a nerve, sending branches to a given muscle, supplies branches to the joint moved by the muscle and to the area of skin over the muscle. Since the facet joints have cartilage, synovial lining, ligaments and related muscles, they are subject to the same insults as other joints, including sprain with congestion and effusion from the synovial membrane. The nerve endings of the affected area are irritated, setting up reflex muscular spasm in an attempt to splint the part and rest the injured structures from further motion. Local pain and tenderness are caused by localized swelling at the point of injury or effusion. Referred pain is sent along the peripheral distribution of the spinal nerve supplying innervation to the injured parts. The ligaments, periosteum and synovial membrane of the articular facet joints derive their innervation from the recurrent nerve which is given off from each spinal nerve before the posterior primary division branching occurs.

### Mechanics

We scoff at irregular practitioners and patients who speak of having a vertebra out of place and having it put back, inferring that a dislocation has occurred. Of course, if a vertebra is really dislocated serious damage to vital soft structures results. What such remarks mean is that a subluxation has occurred. The term subluxation is used when the articular facets are in contact but not in their normal anatomic relationship, impaired movement of the joint resulting. Such a state is referred to sometimes as an osteopathic spinal lesion. Subluxation should be distinguished from dislocation with complete displacement of one articular surface from another and total dissociation of the joint.

Subluxation is produced either by muscular force around the joint or by external violence which forces the joint beyond its normal range of motion, in either case resulting in irritation of the joint structures. The natural tendency, after slight movement of the facet joints beyond their normal planes, would be for a rebound to occur, restoring the facets to their normal relations. This happens often. But an abnormal sequence of events may occur if moderate or marked insult has been suffered. The maintenance of a subluxation requires that the facets be moved beyond their normal range and be held there by sustained muscular contraction. The spinal muscles are supplied by the posterior primary divisions of the spinal nerves and observe the embryonic segmental arrangement which leads to their supplying segments of the spinal musculature. As soon as a facet joint has exceeded its normal range of motion and the joint structures are injured, a stream of afferent impulses is sent to the cord; some ascend to the sensory area of the brain cortex, where they register as pain, while others complete a simple reflex arc in the spinal cord and are transferred to the lower motor neurons to bring about contraction of associated spinal muscles or perhaps related groups. Thus the subluxation is maintained by muscular contraction. That the splanchnic functions are segmentally bound

with the somatic is seen in the contraction of abdominal and spinal muscles in acute abdominal visceral inflammations. Conversely, abnormal congestion around nerve roots bordered by deranged facets may be accompanied by visceral symptoms or pain in the body wall. Correction of a facet subluxation requires that the reflexly contracted muscles be relaxed and the articular surfaces restored to their normal relationship. The first may be accomplished by heat followed by kneading of the tense muscles, and the second by force properly applied at the joint.

Instead of muscular contractions causing fixation of a subluxation which has already occurred, muscular action may cause a subluxation. Sustained muscular contraction or hypertension as a result of straining, prolonged wrong posture or exposure to cold, especially after perspiring, may cause subluxation or compression of facet joints. When facets in normal relation are compressed for prolonged periods by hypertense muscles, the synovial fluid, which is like the white of an uncooked egg, becomes concentrated owing to impaired circulation to the synovial membrane which secretes it, a tenacious lubricating substance which is too thick to allow free movement resulting. Then the facets are locked together without being out of place. This abnormal fixation sets off a train of reflexes similar to those occurring after subluxation; but spasm of the associated muscle bundles, pain and tenderness are more likely to be bilateral and symmetrical.

No mystery surrounds the cause of common derangements of the facet joints. Normal facet joint relation depends on optimum posture, good muscle balance and correct body mechanics with rhythmic movement and coordination. Good static or dynamic posture is dependent on a living, active state. A fresh cadaver when held erect slumps into a position of static strain, with feet flat, knees knocked, pelvis tilted forward and physiologic curves increased. In poor living posture, with wrong body mechanics, much the same position may be assumed, with the lumbar and cervical facets over riding and the thoracic ones migrating apart. If such posture becomes habitual, the capsules of the facet joints are in abnormal relation, which interferes with the circulation to the synovial lining resulting in poor lubrication and a tendency to formation of adhesions. In the early plastic stage of formation, cobwebby adhesions will be disrupted on assumption of correct posture and body mechanics which encourage habitual play of the joints through a completely normal range of motion. If the plastic adhesions are a little older, denser and tougher, change to a proper center of gravity will not disrupt them and may cause an ache described by the patient as a drawing or pulling. Adhesions in this phase of the plastic stage may be released by careful manipulation, the facets being put through a normal range of movement, and correct body mechanics will then protect against recurrence. One important corrective and preventive maneuver is physiologic walking.

We have concerned ourselves with many important phases of walking without giving much, if any, attention to the normal play of the facet joints. We are familiar with the fact that when we walk one arm moves forward as the opposite leg advances. This movement may be largely automatic, being limited to the arms and legs while the spine is held stiff. In this case the patient may look straight, but he lacks the effect of free active trunk movement, tires easily and develops sore spots from having metabolic products locked in the muscles of the back. In physiologic walking, as the body weight is thrust forward by a spring from the foot, the weight-bearing leg is left behind and the shoulder of the same side is swung forward with the arm, riding the facet joints the full length of the spine through a complete arc of motion which glides from one vertebra to the next in rhythmic fashion, giving full play to the segmentally arranged deep back muscles, so that circulation in the muscles and



in the linings of the facet joints is facilitated. Each step of walking carried out with correct detail stimulates normal physiology of the facet joints and related structures. Instead of employing this spring-and-swing light, rhythmic walking, many persons fail to rotate the spine on its axis at each step but jar it with hard, heavy steps or loosen the sacroiliac joints by a positive Trendelenburg waddle which fails to use protective muscles and mechanics and compresses most of the facet joints. In the absence of disease processes, patients who learn to walk so that the thorax rotates in the opposite direction from the pelvis at each step and who maintain an optimum center of gravity tire less easily, do not develop sore spots in sluggish areas along the spine and are less susceptible to minor insults and facet subluxations from poor body mechanics.

Having a short leg or small buttock or habitually standing on one leg or crossing one knee over the other results in compression of facet joints on the side of the concavity of the resultant curve, causing synovial irritation with the sequence of events already described. If this distortion is long continued, adhesions, hypertension of muscles, fibromyositis, pain and disability may result. Restoration of normal body mechanics and correct habits are essential to lasting relief and permanent recovery. Probably no harm results from alternate standing on one leg or crossing knees; but careful questioning and observation show that most people stand more on one leg than on each alternately or cross one knee more than the other. True short leg or atrophied buttock should receive adequate elevation to restore normal alignment. Treatment to reduce facet compression, subluxation or adhesions will give only temporary benefit if all etiologic factors are not corrected.

Most of us are familiar with the effect that prolonged sitting at a desk or an automobile trip of several hours has on the lumbosacral facet joints. If the weight of the trunk is not taken squarely on the ischial tuberosities, and if the trunk slouches, repeated jarring or gradual settling irritates the facet joints. If traumatic synovitis results, with swelling and effusion, related muscles go into spasm in response to irritation of the recurrent nerve branches, and when an attempt is made to stand erect, the patient is unable to straighten unaided, or climbs up the thighs with the hands and then maintains the erect position by bracing his hands on the lower back. Mild insults of this sort may be relieved by rest, heat and massage. But if often repeated, such static strain may lead to traumatic arthritis and associated fibromyositis, which add to the pain and disability and prolong recovery. Such distress may be avoided by eliminating prolonged sitting. Standing and stretching every half hour or preferably walking briskly across the room and back will add to comfort and efficiency, mental and physical. When one is motoring, lifting the hips off the seat every half hour, retracting the gluteals and leaning forward with the spine straight and elbows on the knees at reasonable intervals will be helpful. Stopping the car once an hour in order to take a short brisk walk aids in assuring normal physiologic activity and avoiding strain, especially on the facet joints.

After certain infections, such as influenza, undulant fever and poliomyelitis, toxins impair the normal metabolism in the synovial membrane, including that of the facet joints of the spine. After the acute illness one sees typical synovitis with muscular hypertension, which in some instances has started as reflex spasm. Rest and fomentations usually give relief if the patient is seen early. If no treatment has been given until the subacute or chronic stage, diminished lubrication, adhesions and muscular hypertension may be present. Heat, deep friction and physiologic movement may restore normal function. But recovery may be limited by restraining bands of adhesions in muscle sheaths or facet joints, and these must be released by careful manipulation with or without anesthesia, according to the ability of the patient to relax and the stage of organization

of the adhesions. With preliminary physical therapy to reduce congestion, pain and tension, most moderate limitations may be relieved without anesthesia if maneuvers are carefully used in the right plane with scientific precision. Again, correct body mechanics must be taught to hold the gain made.

We have had occasion to see the application of knowledge of the physiology of the spine and facet joints, with related structures, to casualties in the armed forces, including those in training and those returning from theaters of battle. Observation of air cadets who are stationed on the university campus and drill in view of the medical center hospitals has been of interest. Various groups come, train and depart. We pass them in driving to and from the hospitals and see successive groups mature from new recruits, with all grades of posture and body mechanics, who appear tense and at a disadvantage in drilling and marching, to confident, well poised men with a military precision and a rhythm of movement which conserve energy and develop endurance. Their initial tramping along gradually changes to a springy step with a free, active swing of the body which exercises each facet joint of the spine. One observes an increase in the range of rhythmic, free movement when they sing as they march. Much better physiology is apparent than in the stiff goose step of other troops, who march with rigid spines, jarring tread and stern countenance. So much for psychologic and dynamic influence on mechanics of the spine, favoring normal play of the facet joints. Military and civilian personnel sustain minor sprains of the back with various disabilities, an appreciable number showing derangement of facet joints. These are analyzed and treated along the lines already indicated.

#### Cautions

Contraindications to manipulation of the joints under discussion should be apparent to any one trained in differential diagnosis. Among the local conditions which may be aggravated by manipulation are acute arthritis; spur formations; osteoporosis; fractures; destructive or proliferative disease of bones, joints or encased nervous tissue; abnormal anatomic relations, such as anomalous facets or other vertebral parts; spondylolisthesis, and ruptured intervertebral disk. One should bear in mind the danger of injury to growing epiphyses in young persons and to brittle bones or rigid joints in those of advanced years.

#### Conclusions

For the past eight years I have made a careful study of available material, laboratory and clinical, and am inclined to think that the conclusions reached by Dr. Wharton Hood many years ago apply to derangement of facet joints. He taught that "when skilled observation has excluded possible disease processes and elements of danger, the rectification of displacement or the rupture of adhesions may be followed by the most favorable results." To this may be added other points of importance for retaining relief and correction by restoration of protective body mechanics, proper posture and rhythmic coordinated movement.



## FEVER AND SULFADIAZINE THERAPY IN RESISTANT GONORRHEA \*

CAPTAIN SIDNEY LIGHT

and

MAJOR VERNON DICK

MEDICAL CORPS, ARMY OF THE UNITED STATES

The high percentage of prompt cures following the use of the sulfonamide compounds in the treatment of acute gonorrhea has eclipsed the effectiveness previously demonstrated by the use of fever alone in the treatment of this disease and its complications. The reported percentage of cures with the sulfonamide compounds varies widely among different authors. Cox<sup>1</sup> placed the figure at near 70 per cent and said that passage of time rather than repeated courses accounts for the disappearance of the organism in another 10 per cent. He feels, as do many others, that the proportion of patients with drug-resistant infections is increasing, probably as a result of the early cure of those infected with the easily killed strains. This leaves a sizable group of infected patients who remain infectious as well as subject to chronic secondary complications. The amazing success of penicillin in the treatment of patients with refractory infections<sup>2</sup> indicates the eventual solution of this problem, but for the present and until this new drug is available to all, the combined treatment employing fever and administration of the sulfonamide compounds is highly satisfactory and should be instituted as soon as drug resistance is recognized, especially if there is arthritic involvement.

Warren, Carpenter and their group<sup>3</sup> established the thermal lethal time for different strains of gonococci. In 1937, Wengatz<sup>4</sup> found that the thermal death time could be halved if the organism was subjected to an elevated temperature in an environment of 0.01 per cent sulfanilamide. During the same year Ballenger and his co-workers<sup>5</sup> treated gonorrhea with artificial fever and sulfanilamide. Their dosage of both drug and fever was cautious and only partially effective. In the following year Owens, Wright and Lewis<sup>6</sup> used adequate doses of the drug and high fever levels for five hours with excellent results in 4 patients. The first report on a series of significant size was that of Rose, Kendell and Simpson.<sup>7</sup> They were able to reduce the number of hours of treatment to eight and offered a more heroic schedule of chemotherapy. Their recommendation of at least eight hours of fever was endorsed by Batchelor, Thomson and Huggan.<sup>8</sup> Ferguson, Buchholtz and Gersten<sup>9</sup> showed that a shorter duration of fever was less effective.

We have treated 119 young men with recently acquired sulfonamide-resistant gonorrhea by combined drug and fever therapy. All had failed to respond to two or more courses of sulfonamide compounds, each course consisting of at least 20 Gm. of drug given in five days.

Material from the urethra or prostate was studied by Gram stain and culture in all cases prior to treatment, and no infection was considered gonorrhea unless gram-negative intracellular diplococci of typical morphology were seen on stain or unless gonococci were found by culture. After the combined treatment prostatic fluid was obtained for smear and culture as soon as it

\* Read at the Twenty-second Annual Session of the American Congress of Physical Therapy, Chicago, Sept. 8, 1943.

could be obtained safely, usually two to five days after the fever. This examination was repeated at five to seven day intervals. Patients were considered cured if symptoms disappeared, urethral discharge ceased, specimens of urine cleared or showed haziness or light shreds in the first glass only, and three successive smears and cultures of prostatic fluid were negative for gonococci.

Because there was occasionally an unavoidable interval of three to four weeks between the date of the last positive laboratory study and the date of fever therapy, it is possible that in a few patients no gonococci were present at the time fever was given, and nonspecific infections were treated. These patients were not included in this report, however, unless the symptoms and the character of the urethral discharge remained unaltered throughout the prefever period. Though such patients were few, the percentage of cures reported must necessarily be open to some question. Further doubt is also conceded in view of the fact that the majority of patients were followed for only about one month and the possibility of later recurrence of infection in some cannot be ruled out.

### Methods and Complications

*Administration of Fever.* — Conditioning elevations of temperature were induced in all patients at least once before treatment. On the day preceding treatment fluids were forced up to 3,000 cc. and carbohydrates were given in the form of sweetened orange juice. An air-conditioned cabinet without convective heat was used. Induction at an environmental temperature of 120 F. was usually effected in about ninety minutes. The systemic temperature could usually be maintained at high humidity with an average cabinet temperature of less than 110 F. Pantopon was used in small doses as a sedative and repeated when restlessness increased. Fluids were given by mouth in the form of 0.3 per cent iced salt solution. An intake of more than 400 cc. per hour was discouraged because of the regurgitation seen after forced drinking. Oxygen was given continuously through a nasal catheter. The treatment was terminated with electric fanning.

*Administration of Sulfonamide Compounds.* — Originally we employed the method of drug administration of Rose, Kendell and Simpson. The patient was given 10 Gm. of sulfadiazine in divided doses during the eighteen hours immediately preceding treatment. In the first 34 patients we found that the average concentration in the blood at the beginning of treatment was 12.2 mg. per hundred cubic centimeters. In 4 the concentration was above 15 mg. All but one were cured and in the one failure the concentration was 16 mg. per hundred cubic centimeters. The clinical picture in those with the highest concentrations was disturbing because of the intense blue color of the lips, which was not appreciably improved by continuous oxygen inhalation. Because the drug concentration occasionally mounted during treatment and toxic manifestations might appear, and because lower concentrations were effective, we decided to give a trial administration of the drug before treatment.

Each patient was given 10 Gm. of the drug during the eighteen hours of the prefever treatment. From blood chemistry studies of these patients an attempt was made to estimate the amount of medication required to attain a concentration in the blood of 11 to 12 mg. per hundred cubic centimeters at the hour when fever would be started. Table 1 shows some typical results obtained.

From this table it can be seen that when the dose is individualized for each patient a high concentration during treatment can usually be avoided



TABLE 1. — *Results of Blood Chemistry Studies.*

Blood Concentration 2 Hrs. After the 10 Gm. Was Given	Number of Grams Given Before Actual Treatment	Blood Concentration 2 Hrs. After Last Dose of Drug Was Given on Day of Treatment
16.7 mgs. per cent	7	11.1
15.3	7	10.5
14.5	8	12.9
14.1	8	12.3
13.7	8	14.3
13.2	9	11.6
12.5	10	12.9
11.9	10	11.6
10.3	11	10.8
9.5	11	11.9
8.0	12	10.0
7.0	12	10.6

and a low concentration can be recognized and supplemented with a higher dosage.

When the drug is administered up to the hour of treatment it remains in the stomach and may provoke vomiting. By changing the schedule of drug ingestion so that the last dose was given at or before 5 a. m. instead of at 7 a. m., we reduced the incidence of vomiting during treatment.

Post-treatment vomiting occurred after the temperature had fallen below 102 F., and although it was frequently accompanied by some degree of headache it was much less distressing than that which occurred during treatment.

The choice of the sulfonamide compound varies among different workers. Some feel that sulfadiazine will stop the urethral discharge without curing the infection, with the result that the discharge returns. Some feel that sulfathiazole causes fewer urinary complications. We have administered massive doses of sulfadiazine to more than 130 patients and encountered mild lumbar pain in only 1 of them. Forcing of fluids may account for this good fortune. In 2 patients short-lived jaundice not associated with other symptoms developed on the day after fever therapy. Neither of these had jaundice from a similar dose of drug without fever. Five patients who could not tolerate sulfathiazole easily acquired a tolerance for the full dose of sulfadiazine after it had been administered in gradually increased amounts. The concentrations in the blood which can be obtained and maintained with sulfadiazine are higher than those with sulfathiazole. For these reasons we prefer sulfadiazine.

*Duration of Fever.* — Before the introduction of the sulfonamide compounds it was established that if the gonococcus was exposed to a temperature of 106.7 F. for a sufficiently prolonged period it would die. With the concurrent use of drugs, all workers agree that the systemic temperature need not exceed 106 F. The number of failures in patients exposed to fever for eight or more hours is small.<sup>10</sup> On several occasions we have had to discontinue fever after only three hours of treatment. Cerebral edema developed in 3 patients after the fifth hour of treatment. Although each made a completely uneventful recovery, the possibility of a fatal outcome forced us to shorten the duration of fever to seven hours or until the condition of the patient warranted discontinuance. Table 2 lists the results obtained for different durations of fever.

This compilation has no statistical value because the groups are small, unequal and selective. The percentage of cures is probably too high for each duration; the results are presented in this manner to indicate that, while a treatment of eight hours is most satisfactory, the likelihood of a

TABLE 2. — *Results of Various Periods of Fever.*

No. of Hours	No. of Patients	No. of Patients Cured in One Treatment	Per Cent Cured in One Treatment
10	18	17	94
8	10	10	100
7	28	25	89
6	38	34	89
5	15	14	88
Less than 5	10	5	50
	119	105	88

cure when treatment has to be discontinued sooner is considerable and there should be no hesitancy in interrupting the treatment when the patient exhibits early signs of cerebral edema or exhaustion.

*Cerebral Edema.* — Too little about the recognition and treatment of cerebral edema is mentioned in the literature on fever, although the description by Ewalt and associates<sup>11</sup> is excellent. Convulsive cerebral edema occurred in 3 of our patients. In each there were sudden loss of consciousness, generalized spasm of the flexor muscles, cessation of breathing and marked cyanosis. In 2 there was loss of sphincteric control, and in 1 regurgitation of gastric contents. Our method of dealing with this dramatic accident was the immediate institution of artificial respiration with the patient prone, lowering the head to prevent asphyxia from aspiration of stomach contents and immediate electric fanning. Fifty cubic centimeters of 50 per cent dextrose was given intravenously as soon thereafter as possible. Isotonic solutions are contraindicated as contributory to continued edema. Epinephrine should not be given, because vasoconstriction will delay heat radiation from the body.

*Use of Chlorides.* — In some clinics chlorides are given to the patient on the day preceding treatment, presumably to compensate for the anticipated loss of chlorides. Originally we administered 8 Gm. of sodium chloride in divided doses on the day before fever. There were complaints from several patients of gastric symptoms and we decided to eliminate chlorides from our routine. Blood chloride levels were determined at the beginning and end of each treatment for 14 consecutive patients, of whom only the first 7 received chlorides on the day before treatment. The average blood chloride levels in each group were almost identical and indicated that there is no appreciable blood chloride storage. It is argued that the tissues store the chloride and release it during periods of chloride depletion. There is no simple or rapid method of determining chloride tissue storage. If the brain stores too much chloride there may be a predisposition to cerebral edema. Our 3 patients with cerebral edema had had chlorides on the day before treatment. In a larger group to whom no additional salt was given on the day before treatment there were no instances of cerebral edema. We believe that an adequate amount of salt can be given during the treatment by mouth or intravenously.

*Blood Pressure.* — The chief difficulty we have encountered with the humid hot air cabinet is the fall of systolic blood pressure. The opinion of Warren<sup>12</sup> that this is a sign of dehydration was substantiated by us in most instances by the finding of an elevated specific gravity of the serum. A continuous intravenous infusion of 5 per cent dextrose in saline solution was administered to all patients whose systolic blood pressure fell below 100 mm. of mercury. In a few patients who perspired at a rate so fast we thought it unsafe to inject fluids, the blood pressure could not be maintained above



80 mm. In a patient whose systolic pressure continued to fall in spite of large amounts of saline solution administered parenterally, an infusion of plasma was found satisfactory.

### Summary and Conclusions

Evidence is accumulating that failures with the sulfonamide compounds are concerned with the resistance of the gonococcic strain. The problem of refractory gonorrhea is increasing and will probably be with us for some time. Although penicillin or one of its yet undiscovered derivatives may one day help to make gonorrhea a rare disease, until it is generally available the combined treatment employing fever and the sulfonamide compounds is the most satisfactory method of curing drug-resistant gonorrhea. The duration of the fever should depend on the tolerance of the patient. Eight hours is most desirable, but there should be no hesitancy in discontinuing it and repeating the treatment if necessary. A trial administration to avoid a high concentration of drug in the blood is recommended.

### References

1. Cox, Oscar: Sulfonamide Failures in Gonorrhea. Read at the First Service Company Venereal Disease Conference, Ft. Devens, Mass., July 23, 1943.
2. Keefer, Chester S.: Penicillin in the Treatment of Infections, *J. A. M. A.* **122**:1217 (Aug. 28) 1943.
3. Carpenter, Charles; Boak, Ruth; Mucci, Lawrence, and Warren, Stafford: Studies on the Physiologic Effects of Fever Temperature, *J. Lab. & Clin. Med.* **18**: 981 (July) 1933.
4. Wengatz, H.; Boak, H., and Carpenter, C.: Bactericidal Effect of Sulfanilamide on the Gonococcus in Vitro, *J. Bact.* **35**:36 (Jan.) 1938.
5. Ballenger, E.; Elder, O., and McDonald, H.: Sulfanilamide and Thermotherapy in Gonococcic Infections, *J. A. M. A.* **109**:1037 (Sept. 25) 1937.
6. Owens, C. A.; Wright, W. D., and Lewis, M. D.: The Value of Fever Therapy in Sulfanilamide Resistant Gonorrhea, *J. Urol.* **40**:847 (Dec.) 1938.
7. Rose, D.; Kendell, H., and Simpson, W.: Refractory Gonococcus Infections Eliminated by Combined Artificial Fever and Chemotherapy, *War Med.* **1**:470 (July) 1941.
8. Batchelor, R.; Thomson, G., and Huggan, J.: Combined Inductopyrexia and Chemotherapy in the Treatment of Resistant Gonorrhea, *Edinburgh M. J.* **49**:584 (Sept.) 1942.
9. Ferguson, C.; Buchholtz, M., and Gersten, S.: Single Combined Treatment for Gonorrhea, *Am. J. M. Sc.* **204**:685 (Nov.) 1942.
10. Licht, S., and Dick, V.: Fever Sulfadiazine Therapy in Refractory Gonorrhea. Read at the 137th Annual Meeting of the Medical Meeting of the Medical Society of the State of New York, May 4, 1943.
11. Ewalt, J. R.; Parsons, E. H.; Warren, S. L., and Osborne, S. L.: Fever Therapy Technique, New York, Paul B. Hoeber, Inc., 1939.
12. Warren, Stafford L., Rochester, N. Y.: Personal communication to the authors.



## HISTAMINE ION TRANSFER, A FIVE YEAR EVALUATION \*

IRVIN F. HUMMON, JR., M.D.

Cook County Hospital and Loyola University School of Medicine

CHICAGO, ILLINOIS

The administration of histamine by ion transfer has been advocated by many workers for the treatment of the various forms of arthritis and peripheral vascular diseases.<sup>1, 2, 3</sup> The method was introduced at Cook County Hospital, Chicago, approximately seven years ago. The country was then in the midst of a depression, and this hospital, being a charity institution, was faced with the problem of treating a large number of patients, who had all types of acute and chronic conditions usually treated by physical therapy, with limited equipment, space and personnel. The usefulness of histamine in conditions other than arthritis and peripheral vascular disease had been mentioned,<sup>4, 5</sup> and we began to use it in the management of such conditions as a substitute for heat because of its time-saving possibilities. We found that we were getting results comparable to, or better than, those we had been getting with the usual modalities. Altogether we have given some 10,000 histamine treatments to over 1,000 patients and feel that now, when the problem of a large number of patients and limited personnel is widespread, histamine ion transfer should be given serious consideration as a means of treating many patients efficiently with a minimum of time, equipment and personnel.

Ion transfer is one of the simplest and oldest of physical therapeutic measures, yet surprisingly few physicians use it. To those who have not used it, the technic may seem difficult or messy. Some physicians may have used it and abandoned it because of technical difficulties, especially if they have used asbestos paper or filter paper as a vehicle for the drug, since such paper is apt to tear and is sometimes hard to fit to the irregular contours of the body.

Ion transfer is defined as the introduction of soluble salts into the tissues by means of a direct current.<sup>6</sup> In the administration of histamine, the most commonly used salt is histamine dihydrochloride, which hydrolyzes in an aqueous solution or unction into positive ions of histamine and hydrogen and negative ions of chlorine. The histamine, being positively charged, is caused to move from the positive pole to the negative pole through the intervening electrolyte, comprising the body fluids, under the influence of a constant potential.

### Technic

We have simplified our technic so that the histamine is easily and effectively administered. The technic is applicable either in an institution where the number of patients is large or in a private practice where only an occasional patient is treated.

No preliminary preparation of the part to be treated is necessary. The main precautions are to determine that the skin is of normal sensitivity and to see that no abrasions or denuded areas are present. At the Cook County Hospital we use a solution of 1:1,000 histamine dihydrochloride. A piece of gauze sufficiently large to cover the part to be treated and comprising about four thicknesses is lightly wrung out of the solution. Usually 10 cc. is sufficient. The moistened gauze is laid directly on the skin over the part to be treated. A towel lightly wrung out of tepid tap water is then laid over the gauze. This should be of several thicknesses. Around the towel is placed a

\* Read at the Twenty-second Annual Session of the American Congress of Physical Therapy, Chicago, September 10, 1943.

block tin electrode, which need not cover the entire towel, and the whole is held in place with an elastic bandage. This electrode is connected to the positive pole of a galvanic source. The negative pole is connected to a moist pad which may be placed on any other portion of the skin, preferably some distance from the part being treated, and held in good contact. The galvanic current is slowly turned on until the chosen current density is reached.

In place of the solution of histamine dihydrochloride an ointment containing 1 per cent of the drug may be thinly spread on the skin over the part to be treated and this covered with the moistened towel. The remainder of the technic is the same. An excess of the ointment is of no value, as the amount of histamine transferred is determined by the current used and the time, not by the amount of histamine placed on the surface. The histamine in solution has a tendency to deteriorate with age, and when the volume is small the unction is more satisfactory.

Any source of galvanic current may be used. The current should be smooth, with no irregularities in wave form, and the voltage may be varied up to at least 25 volts and 10 milliamperes of current. The simplest source is a radio B battery.

Our usual dose is fifty milliampere minutes. If we wish to obtain a maximum local effect and a minimum systemic effect, we use 5 milliamperes for ten minutes. If we wish to obtain more of a systemic effect, we use a higher milliamperage, for example, 10 milliamperes for five minutes.

The rationale of using milliampere minutes as a unit of dosage is well illustrated by an experiment on dogs by the late Dr. H. N. Ets. He showed that the fall in blood pressure was approximately the same with intramuscular administration of 0.1 mg. of histamine per kilogram of body weight as with one hundred milliampere minutes of ion transfer, provided the time of ion transfer was not longer than five minutes. The fall of blood pressure in the former case was 32 mm. of mercury. With 20 milliamperes for five minutes it was 28 mm. of mercury; with 40 milliamperes for two and one-half minutes it was 36 mm., and with 80 milliamperes for one and one-fourth minutes it was 36 mm. When the time was longer than five minutes the fall of blood pressure was less; with 10 milliamperes for ten minutes it was only 14 mm. and with 5 milliamperes it was barely perceptible.

### Physiology

Histamine is a naturally occurring product which can be recovered from almost all tissue as a normal constituent. Therefore, when it is used therapeutically, one is not introducing a foreign substance into the body but is merely increasing the concentration of a normally occurring substance in a particular location. The body inactivates and eliminates the added histamine just as it does the normally occurring histamine. Histamine is active in small concentrations, being detectable physiologically in concentrations as small as 1 part in 250,000,000.<sup>7</sup> It has effects on many structures of the body. It is not readily absorbed from the gastrointestinal tract and is usually inactivated in such absorption. It is highly active only when administered parenterally. Because of the fact that histamine is so active in such small concentrations, it lends itself well to administration by ion transfer.

When administered by ion transfer histamine first causes a local reaction and then, as it is absorbed into the blood stream, causes systemic reactions. As the process of inactivation of histamine begins immediately on its introduction into the skin, the degree of the systemic reactions is determined by the rate of administration. If this rate is small the rate of inactivation may be about equal to it, and the systemic reactions are minimal. This relation of rate of administration and systemic effect as shown by fall of blood pressure is well illustrated by the work of Dr. H. N. Ets, previously mentioned.

The local action of histamine on the skin consists in (1) a marked capillary dilatation, which is due to a direct paralyzing action of histamine on the circular fibers of the capillaries; (2) a dilatation of the venules and arterioles of the skin which is evidently due to reflex action, as intact nerve conduction is required for this effect, and (3) the appearance of areas of local edema due to increased permeability of the vessel walls. These strictly local effects probably extend to some depth in the immediate underlying structures. The local vasodilatation remains for from one to four hours and constitutes the main local action of histamine. With it comes an increase in blood to the area and a resultant increase in temperature, ranging from 1 to 4 degrees (F.). Heat and histamine cause similar local effects. Each results in vasodilatation, with increased blood supply to the part involved, resulting in increased interchange of metabolic products between the tissues and the blood stream. Histamine has some advantages over heat in that the time of administration is shorter and the effects last longer. There is usually a greater relaxation of muscle spasm with heat than with histamine, but histamine is better in reducing swelling and discoloration from extravasated blood. These local effects can be made to predominate when the administration is low, that is, when the current is low, of the order of 5 milliamperes.

According to Best and McHenry,<sup>8</sup> in addition to these strictly local effects there are systemic effects from extremely small concentrations of histamine in the circulating blood. The heart rate, cardiac output, velocity of the blood stream, pulmonary ventilation and metabolic rate are all increased. There is an increase in volume, free acidity and total acidity of the gastric juice and in the red cell count and hemoglobin content. The coronary circulation and cerebral circulation are increased.

When the administration rate is above 0.02 mg. per minute, which is above approximately 5 milliamperes, sufficient histamine is absorbed into the blood stream to cause a fall of blood pressure and a feeling of generalized flushing and heat, especially about the head and neck. With much higher concentrations of histamine in the blood stream there may be a feeling of fullness and pounding in the head and a severe headache. This occurs only with rapid administration and is probably due to increased intracranial pressure.

The value of such systemic reactions, especially those obtained with low concentrations of histamine, was brought to our attention by the almost uniform responses of our older patients, who stated that they had a feeling of well-being after histamine treatments given for purely local conditions. Electrocardiographic studies have shown some interesting changes in a few of our cases, but the number so far is too small for any conclusions to be drawn therefrom. It is possible that the amount of histamine produced by activity is reduced in older persons and that the administration of histamine by ion transfer supplies this deficiency.

#### Clinical Uses

At the present time the distribution of our patients being treated by histamine ion transfer is about as follows: 40 per cent have post traumatic conditions, such as those following fracture or dislocation with immobilization; 20 per cent have acute traumatic conditions, such as bursitis, fibrositis, myositis, neuritis and sprains; 20 per cent have arthritis; 5 per cent have peripheral vascular diseases, and 5 per cent have miscellaneous conditions.

In the patients with acute traumatic and post-traumatic conditions, the results obtained with histamine alone or with histamine and exercise are equal to or better than those obtained with the usual heat, massage and exercise. The time of administration is about one third as long, and the same



personnel can easily care for at least twice the number of patients. Massage after histamine ion transfer is contraindicated for this type of condition, as one is trying to get essentially a local and prolonged effect. Massage hastens the dispersal of the histamine deposited through the skin, thus diminishing the length of the local effects and increasing the systemic effects. The diminution of swelling and picking up of discoloration from extravasated blood is sometimes dramatic, especially in the case of acute injuries.

Our experience with the arthritides has been much like that which has previously been reported.<sup>9</sup> The patients usually show some improvement while they are receiving regular treatments, but the improvement is not lasting. They frequently return and state that they wish to have "some more of those electrical treatments," as they felt so much better while they were receiving them. As most of the patients are elderly, it is possible that they miss the systemic effects of histamine as much as the local effects on their arthritis when the treatments are discontinued.

The results in peripheral vascular diseases are not spectacular, but some improvement is usually noted after prolonged therapy.

Histamine ion transfer is particularly useful during the heat of summer, as the patients do not have to dissipate the heat usually applied therapeutically in addition to their own metabolic heat. In the winter they do not have to wait as long before going out into the cold after treatment as they do after being treated with the usual heat modalities.

#### Unfavorable Reactions and Contraindications

In all our experience with histamine ion transfer we have observed 8 unfavorable reactions, none of them severe, the patients usually complaining of a fullness and throbbing in the head and headache. All of the patients had histamine ion transfer without difficulty at other times, either before or after the unfavorable reaction. The only patients we do not treat are those with a definite history of asthma. Those with a history of hay fever we do treat, but are careful to use low current densities in the beginning. We always keep on hand some epinephrine for the possible severe reaction, but as yet have had no occasion to use it.

#### Conclusions

From our experience with histamine we feel that it is a valuable modality and will well repay one for becoming familiar with its ease of application and the excellence of results obtainable.

It is a physiologic form of therapy.

It is simple to apply.

It is quickly set up and may be applied to the patient in any position.

It usually takes about one minute to apply.

It is cheap. The cost averages about 2 cents per treatment.

The treatment time is short, usually from five to ten minutes.

It has beneficial and desirable systemic effects.

Its local effects are similar to those of heat and it may be substituted for heat in many instances.

The local effects last longer than those produced by heat, usually from two to six hours.

It is effective in the treatment of acute injuries, especially in reducing swelling and discoloration.

It permits a limited personnel to care effectively for a large number of patients.

Lieut. Edward G. Warnick, M. C., A. U. S.; Lieut. Merle U. Denker, M. C., A. U. S., and Dr. Roy D. Templeton cooperated in carrying on this work during the past five years. Mrs. Esther Stumbo and Mrs. B. Conti gave technical assistance in the preparation of the paper.

## References

1. Kling, David H., and Sashin, David: Histamine Iontophoresis in Rheumatic Conditions and Deficiencies of Peripheral Circulation, *Arch. Phys. Therapy* **18**:333 (June) 1937.
2. Vas: Experiences with Cataphoretic Histamine Treatment, *Deutsche med. Wchnschr.* **58**:1009, 1932.
3. Deutsch, D.: Histamine zur Therapie Rheumatischer Erkrankungen, *Med. Klin.* **27**:1491 (Oct. 9) 1931.
4. Baker, Frances: Indications and Technic of Iontophoresis, *Arch. Phys. Therapy* **20**:197 (April) 1939.
5. Kovács, Richard: Ionic Medication, *Physiotherapy Rev.* **16**:89 (May and June) 1937.
6. Klumpp, Theodore G., and Carter, Howard A.: Ion Transfer (Iontophoresis), *Arch. Phys. Therapy* **22**:491 (Aug.) 1941.
7. Dale, H. H., and Laidlaw, P. P.: *J. Physiol.* **52**:110, 1918.
8. Best, C. H., and McHenry, E. W.: Histamine, *Physiol. Rev.* **11**:371 (Oct.) 1931.
9. Reiley, R. E., and Knapp, M. E.: Symptomatic Relief in Chronic and Acute Arthritides by Histamine Iontophoresis, *Arch. Phys. Therapy* **22**:288 (May) 1941.

---

---

**FLEXIBILITY OF HEALTHY CHILDREN \*****A. D. GUREWITSCH, M.D.**

NEW YORK, N. Y.

and

**MARGARET A. O'NEILL, M.A., R.P.T.**

WEST HAVERSTRAW, N. Y.

During the last few years a school of thought has held that muscle spasm is a primary symptom in infantile paralysis. Sister Elizabeth Kenny, who is responsible for this concept, has established criteria for the recognition of muscle spasm. Following these lines, physicians have paid more attention to examining patients for muscle tightness.

Often, however, the clinical evaluation of the findings is not easy. Before one can decide on the significance of increased tightness, one needs a clearer idea of what normal flexibility is.

In treating patients with acute infantile paralysis who at the onset of the disease present symptoms of painful and contracted muscles, it is often difficult to decide when a muscle has reached its "normal" elasticity and at what point treatment should be discontinued. Furthermore, in examining patients who have had infantile paralysis in the past and who originally did not receive treatment for muscle spasm, it is often difficult to determine whether muscle tightness beyond the normal average is present. Finally, it is not always easy to establish the pathologic significance of diminished flexibility in patients who had no history of, or only a questionable history of, infantile paralysis.

Sister Kenny has described criteria of what she considers to be normal flexibility. She makes use of certain exercises which she thinks any normal person should be able to perform and any patient with infantile paralysis should aim to perform before treatment is discontinued. Some of these are straight leg raising to 90 degrees, bending forward with straight knees and touching the floor with the finger tips and bending forward while sitting with the knees straight until the forehead reaches the patella.

---

\* From the New York State Reconstruction Home, West Haverstraw, N. Y.



In following the suggested routine of examination with all types of patients, with and without a history of infantile paralysis, we found that a good number were unable to perform the tests mentioned, without our being able to attribute a clinical significance to their diminished flexibility. We therefore decided to examine a group of normal healthy children in an attempt to learn what flexibility is normal for different age groups.

We examined 513 healthy children between 4 and 18 years of age.\* Children with deformities, children with a history of infantile paralysis and those who had recently suffered a confining disease were excluded. As test exercises we selected five movements, all of them among those used by Sister Kenny and all of them requiring neither intelligence nor training for their performance. These exercises were as follows:

1. Standing and touching the finger tips to the floor with the knees straight (the children all wore low-heeled shoes). If the floor could not be touched, the minimum distance which could be maintained for about two seconds was measured in inches.

2. Sitting on the edge of a table with the knees bent and bending the trunk until the forehead touched the knees. If this was not accomplished, the distance was measured from hair line to midpatella in a position which could be maintained without the use of the hands.

3. Sitting on a table with the knees straight, with the performance measured as in exercise 2.

- 4 and 5. Lying supine on a table and carrying out passive straight leg raising, left and right. The minimum angle to which the leg could be lifted passively in relation to the trunk was measured, starting from 180 to 90 degrees and better. No angles of less than 90 degrees were recorded.

The children did not know in advance what they would be asked to do. They had not tried to limber up especially for the test. Nearly all of them came into the gymnasium from class rooms. The recorded performances showed a wide range of variation. In order to provide as practical and usable a survey as possible, we are presenting the results in as simple terms as possible. We shall refer to the exercises by the numbers under which they have been described.

In the accompanying table we have attempted a general survey of the results. The children listed under the heading "Plus" were able in exercise 1 to touch the floor with their finger tips, in exercises 2 and 3 to bring their foreheads down to touch their knees and in exercises 4 and 5 to raise their legs straight, 90 degrees or more.

Of the 513 children, 339, or 66 per cent, could touch the floor with their finger tips with the knees straight (exercise 1), and 467, or 91 per cent, could touch their knees with their foreheads with the knees bent (exercise 2), while only 93, or 18 per cent, could perform the same movement with the knees straight (exercise 3). Straight leg raising to 90 degrees or better was accomplished by 184 children, or 36 per cent, with the left leg (exercise 4) and by 191 children, or 37 per cent, with the right leg (exercise 5).

In chart 1 we analyzed the performance by separating the boys and girls. We found not a great, but still a definite, difference in favor of greater flexibility of the girls in four of the five exercises.

The relationship of age to flexibility is shown in chart 2. The four curves show according to age the percentage of children who could be placed in the plus group for the first four exercises. We have eliminated the fifth exercise, as it is practically identical with the fourth. It can be noted that there is a certain similarity in all four curves. This could be expected, as all four exercises are concerned with the flexibility of the same group of muscles: posterior neck, back and posterior leg muscles. The results of all the tests were usually similar in the same person.

\* The authorities of the Haverstraw High School gave us permission to carry out these examinations.

All four curves show a low value for the 5 year olds, a gradual decline of flexibility from 7 to 15 years and a rise in flexibility from 16 to 18 years. These findings are contrary to what we had expected, especially with regard to the older group. It is possible that this group, which consisted of 40 children, was too small for the drawing of any general conclusions.

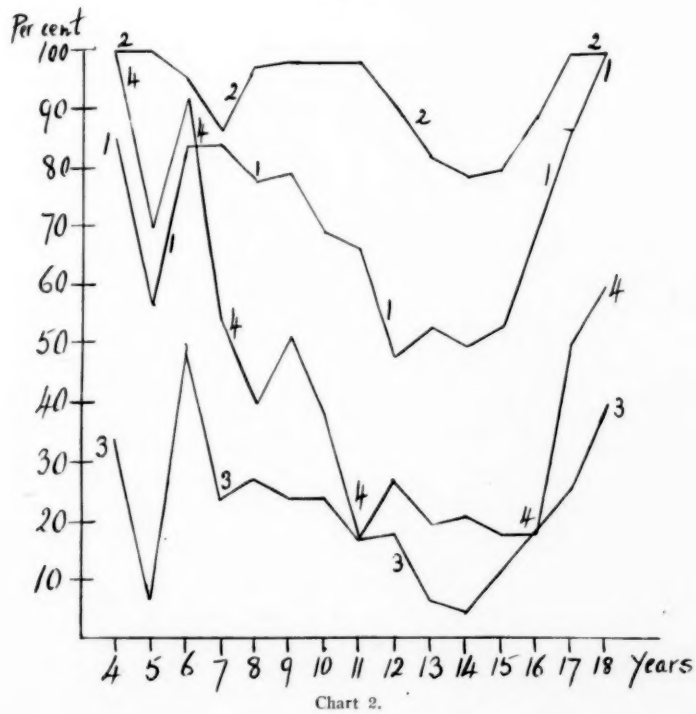
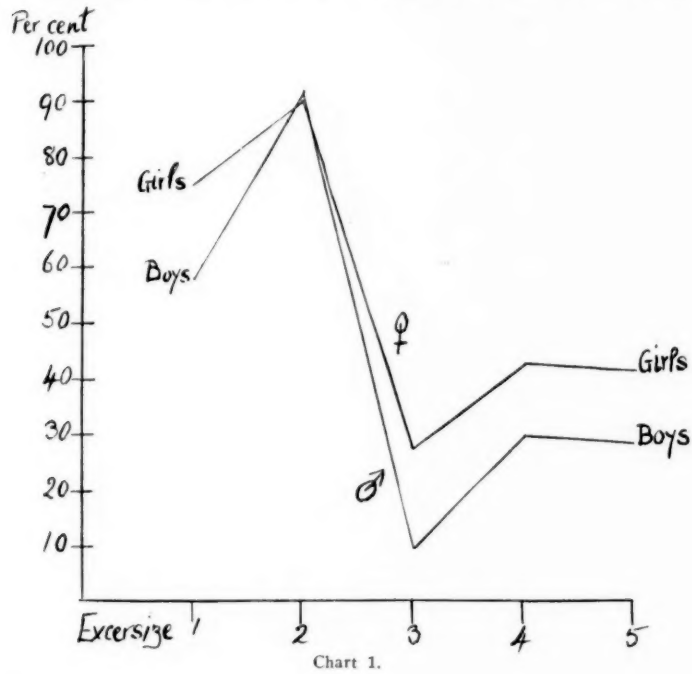
*General Survey of Results.*

Age	Total	Number		Sex		Exercise 1		2		3		4		5	
						+	-	+	-	+	-	+	-	+	-
4	6	♂	0	0	0	0	0	0	0	0	0	0	0	0	0
		♀	6	5	1	6	0	2	4	6	0	4	2		
5	14	♂	11	5	6	11	0	0	11	8	3	7	4		
		♀	3	3	0	3	0	1	2	2	1	2	1		
6	26	♂	8	5	3	8	0	2	6	7	1	5	3		
		♀	18	17	1	17	1	11	7	17	1	17	1		
7	37	♂	20	17	3	17	3	1	19	11	9	12	8		
		♀	17	14	3	15	2	8	9	9	8	9	8		
8	37	♂	18	12	6	18	0	5	13	8	10	7	11		
		♀	19	16	3	18	1	5	14	7	12	8	11		
9	49	♂	29	22	7	28	1	4	25	13	16	12	17		
		♀	20	17	3	20	0	8	12	12	8	12	8		
10	58	♂	29	16	13	29	0	3	26	4	25	4	25		
		♀	29	24	5	28	1	12	17	18	11	18	11		
11	60	♂	39	22	17	39	0	3	36	4	35	6	33		
		♀	21	18	3	20	1	1	20	6	15	6	15		
12	44	♂	19	8	11	16	3	1	18	5	14	5	14		
		♀	25	13	12	24	1	6	19	7	18	8	17		
13	55	♂	25	11	14	19	6	2	23	6	19	6	19		
		♀	30	18	12	26	4	2	28	5	25	7	23		
14	42	♂	23	9	14	20	3	1	22	2	21	3	20		
		♀	29	12	7	13	6	1	18	7	12	7	12		
15	45	♂	32	14	18	27	5	1	31	6	26	6	26		
		♀	13	10	3	9	4	4	9	3	10	7	6		
16	27	♂	19	13	6	17	2	3	16	5	14	4	15		
		♀	8	6	2	7	1	2	6	0	8	1	7		
17	8	♂	5	5	0	5	0	1	4	3	2	3	2		
		♀	3	2	1	3	0	1	2	1	2	1	2		
18	5	♂	5	5	0	5	0	2	3	3	2	3	2		
		♀	0	0	0	0	0	0	0	0	0	0	0		
Summary		♂	282	164	118	258	24	29	253	85	197	83	199		
4-18	513	♀	231	175	56	209	22	64	167	100	131	107	124		
4-18	513	♂ + ♀		339	174	467	46	93	420	184	329	191	322		
4-18	%	♂		58	42	92	8	10	90	30	70	29	71		
	%	♀		75	25	90	9	28	72	43	57	42	58		
4-18	% of Total			66	34	91	9	18	82	36	64	37	63		

In analyzing the minus groups, we found the following facts noteworthy: The number of those who failed to reach the floor with their finger tips was 174, or 34 per cent. The average distance from finger tips to floor was 3.6 inches. The average distance for the whole group of 513 children was 1.2 inches. This exercise indicates flexibility of the posterior neck, back and hamstring muscles as a whole.

Exercise 2 deals with tightness of the neck and back muscles alone. Forty-six children, or 9 per cent, did not succeed in reaching their knees with their foreheads. The average distance was 2.4 inches for the minus group and 0.2 inch for the whole group.

Exercise 3 involves the flexibility of all the posterior muscles as a group. Of the children, 420, or 82 per cent, had to be placed in the minus group. The average distance from forehead to midpatella was 6.9 for the minus



group and 5.6 inch for the entire group. The performance of the different age groups is shown in chart 3.

The same increase in flexibility in the group from 16 to 18 years can be noted here as was demonstrated in the curves of chart 2.

Exercises 4 and 5 test only the posterior leg muscles, without involving

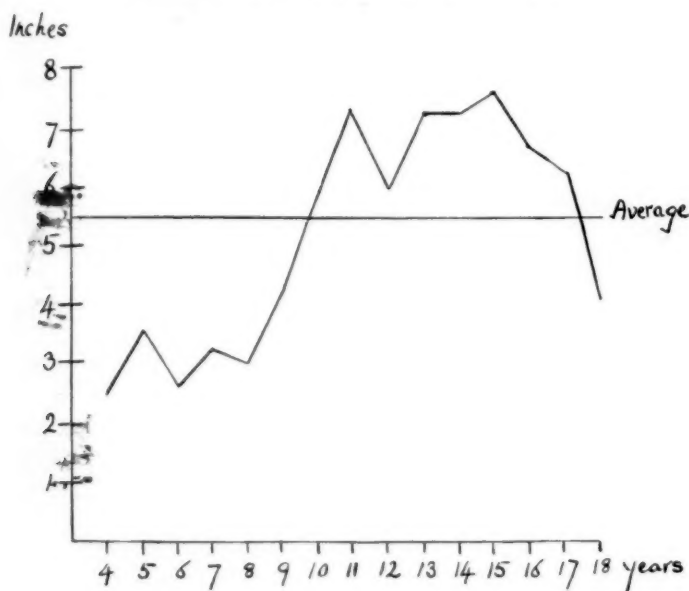


Chart 3.

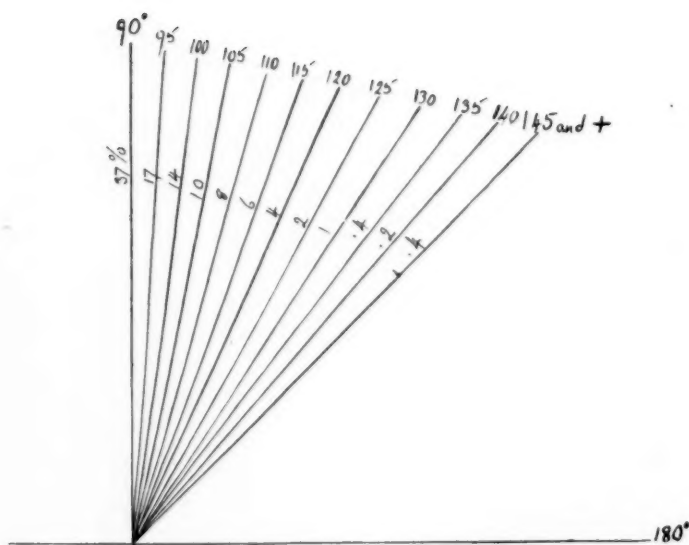


Chart 4.

the back. In exercise 4, 322, or 63 per cent, and in exercise 5, 329, or 64 per cent, had to be placed in the minus group. The difference of only 1 per cent does not quite indicate to what extent the performances of the two legs varied. Actually 178 children, or 35 per cent, did show a difference. In 153, or 30 per cent, the difference was 55 degrees; in 19, or 3.7 per cent, it was 10 degrees, and in 6, or 1 per cent, it was 15 degrees. These differences were equalized, however, in the sum total.

Chart 4 shows the performances of exercise 4 according to the angles achieved.

### Comment

The number of children examined may have been too small for statistical results. The performances varied so widely that it was not possible to draw a base line of comparison for clinical examination, as we had in mind when we started.

This, survey, however, may be helpful in inspiring caution in the interpretation of limited flexibility encountered in patients attending an orthopedic clinic, in patients in acute, subacute and follow-up stages of poliomyelitis and also in normal children. It is well to remember that there are a number of variables which will change the results of standard tests, even in the same person. Training and attempts at limbering up will change test results considerably. If the attention of a patient is drawn to a particular test involving stretching and he is allowed to practice for a few days, or sometimes only for an hour, almost invariably the performance will be found to have improved. For this reason patients treated by the Kenny method of exercise may present performance above the average, which may explain the standards Sister Kenny postulated as "normal." The greater flexibility we found in the age groups from 16 to 18 years may possibly be explained on the ground that the 29 boys of this group were having gymnastic exercises at the time the tests were made, a fact indicating their interest in physical activity and also their more limber state.

Constitution, heredity and sex are a factor in normal flexibility giving a natural wide variation of performance. The opinion widely held that girls are more flexible than boys was confirmed in our study. The influence of age on flexibility could not be brought out clearly by our figures.

Any confining illness will have a stiffening influence. Reexaminations of children with infantile paralysis after they have been confined to bed with a cold long after packs or any treatments have been discontinued will show a marked decrease in flexibility. This holds true for any group of children after a confining illness.

On examination of children suffering from rheumatic carditis, some of whom had been in bed for a year or more, marked shortening of the hamstring and calf muscles was found. In some cases this persisted several weeks after ambulation. For this reason all children who had been kept in bed within four weeks of the test were excluded from our survey.

If a marked decrease in flexibility should be found, it is important to establish whether a change has taken place at a given moment or whether a patient knew all along of his stiffness. Only if a definite change is observed, may the finding be significant. It has been stated that "spasm" in the back may be responsible for scoliosis in poliomyelitis. We checked the spines of those children in our group who showed extremes in stiffness, and we found them to be straight clinically and without history or evidence of poliomyelitis. On the other hand, a good number of patients with so-called idiopathic scoliosis show excellent flexibility with the same test exercises.

### Summary

A group of 513 children between 4 and 18 years were submitted to five simple flexibility tests.

Performances were found to vary widely.

The findings indicate that a variety of factors may be responsible for even marked limitations in flexibility.

Some of the factors for decreased flexibility have been discussed.



# PHYSICAL MEDICINE IN NEUROPSYCHIATRIC DISEASES WITH SPECIAL REFERENCE TO VETERANS ADMINISTRATION BENEFICIARIES \*

A. B. C. KNUDSON, M.D.

United States Veterans Administration

DWIGHT, ILLINOIS

The vast number of neuropsychiatric disabilities among the civilian population, along with the ever increasing disabilities of this type resulting from the war, will put a great demand on physical medicine for several years to come. This will be especially true in the treatment and rehabilitation of veterans in the hospitals of the Veterans Administration.

Physical medicine in its many phases is extremely useful in the treatment of numerous neuropsychiatric conditions. The era of experimentation in this field has been superseded by definite regimens of treatment which have proved their value in maintaining and restoring function, preventing the occurrence of contractures and deformities, and restoring proper nourishment to paralyzed muscles. In some of these cases physical therapy is highly effective; in others it cannot correct the pathologic changes of the disease concerned, but brings definite comfort to the patient, which is in itself of inestimable value.<sup>1</sup>

It will be possible in this paper to present only a brief résumé of some of these disabilities.

## I. Diseases of the Brain

*Hemiplegia.* — This is a symptom complex characterized by an upper motor neuron type of paralysis of the limbs of one side of the body. It results from numerous and varied pathologic processes, but is caused most frequently by thrombosis, embolism or hemorrhage of a cerebral vessel. The degree of impairment and the ultimate prognosis depend on the extent and intensity of the process. During the flaccid stage splints are applied and supportive measures are instituted; in the spastic state radiant heat, massage and passive motion are used; later active exercises are begun. Assistive exercises and re-education are the final steps. Galvanic stimulation is used to advantage in keeping up nutrition of the muscles and preventing contractures.

*Cerebral Palsy.* — This is a paralysis or spasticity most frequently occurring among children. It may be either congenital or acquired, and frequently is accompanied by choreo-athetoid movements, epileptic convulsions and mental retardation. The number of such patients closely approximates the number suffering from infantile paralysis. In England<sup>2</sup> there have been a number of patients who had cerebral palsy due to injuries of the head from bombing, and in the armed forces there is always a definite number. These patients differ in no way from those who have had injuries at birth, except that the possibility of improvement is greater, since there is a mass of previously learned activities, such as walking, use of the arms and writing, which, if the action of the muscles can be restored, will be regained. Chief reliance must be based on physical therapeutic methods in re-education, restraining and relaxation, with carefully planned surgical measures in selected cases. An attempt is made to maintain the nutrition of muscles and to prevent the formation of contractures. Massage and electricity are employed, then passive motion and re-educational exercises. Physical therapy is of

\* This work was done by Dr. Knudson, under the direction of Dr. F. H. Krusen, while on temporary assignment at the Mayo Foundation for instruction in physical medicine.



great value in training the patient to obtain normal balance between flexors and extensors and to acquire accuracy of joint movement and balance function.<sup>3</sup> Emphasis is also placed on anatomic relations, physiologic processes of muscles, body mechanics and restoration of normal automatic functions. This is carried on with further training in occupational therapy.<sup>4</sup>

*Pseudobulbar Palsy.* — In this syndrome one finds disturbances of articulation, phonation, mastication and deglutition due to diseases of the corticobulbar portion of the pyramidal tract. The treatment is similar to that of hemiplegia. Massage and electricity are most beneficial. If there is dysarthria, re-education in phonation is essential.

*General Paresis.* — General paresis is a chronic, gradually progressive disease of the brain caused by *Treponema pallidum*. The essential pathologic feature consists of a diffuse inflammation of the meninges and of the brain itself. Fever therapy for this condition is well established and has induced numerous remissions. Induction of fever is brought about by diathermy, prolonged tub baths or the hypertherm; the latter appears to be the most efficacious. Treatment of 232 parietic patients, in which both malaria and artificial fever were used, was reported by Ewalt and Ebaugh.<sup>5</sup> Remission or improvement was noted in 69 per cent of the artificial fever group as compared with 58 per cent of the therapeutic malaria group. The method of therapy with artificial fever was found safer and productive of better results than malaria. Also, patients who have physical contraindications to therapeutic malaria may be treated safely, in many instances, with artificial fever therapy.

*Paralysis Agitans.* — This was mainly a disease of advanced age until the advent of epidemic encephalitis; now the syndrome is observed in persons of all ages. There are rhythmic tremor and a gradually increasing rigidity of the body musculature. Warm baths have a favorable effect on the rigidity and should be taken daily. Fever therapy has proved valuable in some cases. Gentle massage and mild exercises may be of benefit.

*Tumors of the Brain.* — The treatment of tumors of the brain is surgical. Treatment with roentgen rays or radium has limited application. Krusen<sup>6</sup> stated that surgical diathermy is employed frequently in treatment of lesions of the brain. "Electrosurgery has been used extensively since 1931 for the removal of certain intracranial tumors, particularly meningiomas and gliomas. Tumors of the brain which had previously been considered inoperable could be removed by this method. Adson employs the high frequency current routinely for hemostasis in all types of neurosurgery."

## II. Diseases of the Spinal Cord

*Myelitis.* — In this disease an acute inflammatory process may affect any part of the spinal cord diffusely; destructive changes result at the level of the lesion. In complete transverse myelitis there is sensory and motor paralysis below the involved area. In incomplete transverse lesions the symptoms depend on the tracts affected. Treatment is aimed at restoring function. If the cause of the infection is known, an attempt is made to eradicate it. Massage of the paralyzed limbs is necessary; electricity is employed to keep the muscles exercised. Diathermy has been used with good results in treatment of acute myelitis. Ultraviolet radiation is used in treating trophic lesions which may develop. Warm baths are especially indicated for spasticity. When some restoration of function has been achieved passive exercises are initiated.

*Acute Anterior Poliomyelitis.* — The treatment of this disease in the acute stage has undergone recent change with the advent of the Sister Kenny technic. However, it will take time properly to evaluate her method, the details of which will not be given in this paper. In later stages one may be guided by the statement of Lewin,<sup>7, 8</sup> "Electrical muscle stimulation offers a definite aid in restoring

the power of weakened and paralyzed muscles, in conjunction with educational exercise and orthopedic support." However, it should be borne in mind, as stated by Krusen, that "Electrical stimulation, if improperly applied, may stimulate and thus increase the tone of stronger muscles and overfatigue weaker muscles, which tends to exaggerate a pre-existing muscular imbalance."

*Tabes Dorsalis.* — Tabes is a chronic progressive disease of the nervous system, occurring in a relatively small percentage of persons affected with syphilis. There is degeneration of the posterior columns of the cord, usually associated with involvement of the optic nerve. The tabetic pains and crises are resistive to treatment, but in some cases short wave diathermy over the spine may give considerable relief, care being given to prevent burns. The re-educational exercises of Frankel are helpful in many cases of ataxia. Coulter<sup>9</sup> has devised a system of exercises which is beneficial in improving co-ordination, while avoiding as much as possible the development of fatigue.

*Syringomyelia.* — This is a chronic, slowly progressive disease of the spinal cord, characterized by formation of cavities and gliosis within the spinal cord. The symptoms depend on the tracts invaded and destroyed. Atrophy and paralysis are frequent. It must be remembered that the destroyed tissue cannot be replaced. Treatment is mainly symptomatic. When paralyses develop, heat and massage are used to preserve nutrition and prevent contractures in spastic muscles. If a flaccid condition exists splints, massage and electricity are of value to prevent deformities and keep the muscles healthy.

*Hematomyelia.* — "Hematomyelia is an apoplectiform hemorrhage into the gray matter of the spinal cord."<sup>10</sup> It may occur at any level of the cord, but occurs most frequently in the cervical enlargement. Physical therapeutic measures are essentially the same as for syringomyelia.

*Tumors of the Spinal Cord.* — These tumors are classified as intramedullary and extramedullary, the latter being divided into intradural and extradural. The treatment consists of the operative removal of the tumor and is therefore surgical. Postoperatively, however, physical therapy is important in restoring function which has been impaired by compression. Massage, electricity, passive and active exercise and light treatments are important adjuncts to the operative treatment, in order to obtain as complete a restoration of function as possible.

### III. Diseases of the Peripheral Nerves

"When a peripheral nerve is injured or diseased the fibers distal to the point of injury undergo definite pathologic changes."<sup>10</sup> The causative agent may be trauma, inflammation or toxic degeneration; "if the effect is sufficiently severe the result is an interruption in the structural and functional continuity of the nerve."<sup>10</sup> Electricity should not be used in the early painful stage; later mild galvanic stimulation with large electrodes is used.<sup>11</sup> Massage is of considerable value in the later stages. Passive motion is of definite value; active movements should be instituted as soon as the pain has subsided. If contractures have set in, an attempt should be made to overcome them by means of passive stretching. Following the suturing of nerves, gentle massage, passive manipulation and mild galvanization of the muscles are used. The nutrition and tone of the muscles are thereby maintained, and contractures are avoided or overcome.

Krusen stated, "For the various types of neuralgia, neuritis and radiculitis deep heating by means of diathermy may serve to lessen pain and diminish inflammation. For acute inflammation of the nerves, very mild heating should be used during the first one or two treatments. If the symptoms are not aggravated, the diathermy applications may be continued in gradually increasing intensity."

Ulanski<sup>12</sup> reported that the intractable pain of trigeminal neuralgia (tic douloureux) was treated successfully with the rapid sinusoidal current. He re-

ported only nine failures in a series of sixty-six cases. Relief varied from a few months to three or more years, with immediate response to repetition of treatment on the return of pain.

Peripheral facial paralysis (Bell's palsy) is a very common condition. Exposure and chill are the usual causes, but there are frequently other factors. Kovács<sup>13</sup> stated, "Physical measures are the main standby of conservative treatment of facial paralyses. In the rheumatic or refrigeration type of facial paralysis the immediate employment of decongestive measures, thermal, electrochemical, or mechanical, is indicated." It has been proved that physical therapy aids materially in bringing about a more complete regeneration of the nerve and restoration of its function.<sup>14</sup>

We now come to the psychiatric phase of the subject.

#### IV. Psychoses

Psychotic patients are subject to all the various neurologic disabilities from which normal persons suffer and in mental institutions physical measures are used extensively in their treatment. In addition, numerous physical therapeutic measures are used with advantage in treating psychotic symptoms, such as hyperactivity, depression, agitation and mania. The continuous tub bath has proved very beneficial. Debilitated patients benefit from other forms of hydrotherapy, heat, massage and ultraviolet radiation. Fever therapy in the treatment of parietic patients has been discussed. Electric shock therapy is of value in psychoses.

"Physical therapy is useful as a part of the eliminative measures used in the detoxification of patients with acute alcoholism."<sup>15</sup> It can be used for the promotion of diaphoresis and relaxation. After toxic symptoms have disappeared cold showers and active exercises are beneficial.

#### V. Psychoneuroses

Frequently physical therapeutic measures are used as adjuncts to psychotherapy, and in some forms of neuroses they constitute the major treatment. Among war neuroses have been included such conditions as exhaustion neurosis, shell shock, concussion neurosis, fright neurosis and neurocirculatory asthenia. Some of these are misnomers. Essentially, the war neuroses differ little in their symptoms from those of civil practice.

"The treatment of psychoneuroses after injury is often a baffling problem, and physical therapy departments are often confronted with these trying cases."<sup>16</sup> Often a neurosis is superimposed upon an actual pathologic process. History and diagnosis are important to determine accurately the type of psychogenic mechanism, as well as to exclude malingering.

Physical therapy, by way of general stimulation of the circulatory and nervous systems, offers the best remedy in many of these cases. It produces a suggestive, sedative and tonic effect which exerts an important somatic influence on neurotic patients. Furthermore, physical treatment offers specially favorable conditions for simultaneous psychotherapy.

Since relaxation is often indicated, light massage to the entire body is followed later by heavier massage. Along with massage, hydrotherapy and electrotherapy act as a stimulus to circulation and metabolism. The galvanic current is best used for its stimulative effect. As convalescence progresses, passive and later active exercises are given. These must necessarily be graduated according to the vitality and stamina of the patient. The warm relaxing bath and the cold pack, along with rest and relaxation (such as Jacobson's<sup>17</sup> progressive relaxation method), have all earned a well deserved place in the therapeutic program for the psychoneurotic patient.

Massage should be prescribed and supervised by the physician who knows the type of personality disorder, can predict the effect of the treatment, and can

explain the problem to the technician. Billings<sup>18</sup> has stated that massage is contraindicated in the treatment of certain personality disorders, including homosexuality, agitated depression with an increased sexual urge, and certain hysterical reactions; also for patients who become dependent on the treatment.

From the rehabilitation standpoint the actual amount of lifelong neurotic invalidism will be greatly influenced by an effective program in our Veterans Hospitals for the rehabilitation of discharged veterans of World War II. It has been demonstrated clearly that such a program, properly executed, can prevent latent neurotic dependence from developing into prolonged invalidism requiring hospitalization and government support in the majority of cases.

Physical measures have been employed widely in all Veterans Administration hospitals and outpatient departments, and this will no doubt be expanded widely in the future. The equipment has been set up according to bed capacity and the type of patients under treatment. "Bed capacities usually vary from about 250 to 1600 or more, and the patients fall into three groups; neuropsychiatric patients, tuberculous patients and those requiring general medical or surgical treatment."<sup>19</sup>

Physical therapy considerably shortens the period of treatment of hospitalized veterans in a large number of cases. When applied in the early stages of disease or injury physical measures are extremely valuable in early rehabilitation with restoration of normal function.<sup>20</sup>

This paper would not be complete without mention of the psychologic element in physical therapy. Claims are made by some persons that imply that the effects of certain physical agents are psychologic in nature.<sup>21</sup> For example, it has been stated that certain neuroses that have been improved or cured by physical therapy actually have been improved or cured by psychic effects. However, physical agents and their physiologic effects are definitely known, and further research is establishing more reliable statistics in this regard. It is a fact that any help given a distressed patient by a physician or some specified treatment has a certain psychologic influence. It is the opinion of the writer, however, that the effects of physical therapy are mainly physiologic, and as such, have a definite influence on the bodily tissues of an organic nature. Psychotherapy is a distinct entity in itself and can often be profitably combined with physical measures. Such a combination, the psychologic aspect controlled by the psychiatrist, and the physical therapy supervised by the trained physical therapist, may often yield spectacular results.

In conclusion, may I emphasize that the rehabilitation of the neuropsychiatrically disabled veteran of World War II is already presenting a problem which will undoubtedly grow as the war continues. The hospitals of the Veterans Administration probably will receive the bulwark of this task in the future. May they become strong fortresses of physical therapy directed to helping the disabled veteran to overcome his disability!

#### References

1. Weisenburg, T. H., and Alpers, B. J.: Physical Therapy in Nervous Diseases. In Mock, H. E., Pemberton, Ralph and Coulter, J. S.: Principles and Practice of Physical Therapy. Hagerstown, Maryland, W. F. Prior Company, Inc., 1935, vol. 1, chap. 16, pp. 1-14.
2. Baker, Frances: Physical Therapy in Cerebral Palsy, Arch. Phys. Therapy **23**:473 (Aug.) 1942.
3. Phelps, W. M.: Recent Trends in Cerebral Palsy, Arch. Phys. Therapy **23**:332 (June) 1942.
4. Phelps, W. M.: The Correlation of Physical Therapy and Occupational Therapy in Cerebral Palsy, Arch. Phys. Therapy **22**:587 (Oct.) 1941.
5. Ewalt, J. R., and Ebaugh, F. G.: Treatment of Dementia Paralytica; A Five Year Comparative Study of Artificial Fever Therapy and Therapeutic Malaria in Two Hundred and Thirty-Two Cases, J. A. M. A. **116**:2474 (May 31) 1941.

(Continued on page 241)



# ARCHIVES of PHYSICAL THERAPY

OFFICIAL PUBLICATION AMERICAN CONGRESS OF PHYSICAL THERAPY

## .. EDITORIALS ..

---



*Albert Franklin Tyler*

### DEATH OF DR. TYLER A DISTINCT LOSS TO CONGRESS

Dr. Albert Frank Tyler of Omaha, Nebraska, a founder of the American Congress of Physical Therapy died on February 25, aged 62 years. Dr. Tyler was the guiding light of the Congress during its early years of existence and contributed in more ways than one to its growth and development into the leading physical therapy society of the United States. In the early days Dr. Tyler edited and published the official journal of the society and were it not for his sponsorship the present ARCHIVES would not have been possible. In 1930 he transferred ownership of the journal to the Congress, of which it is now the official mouthpiece.

Dr. Tyler possessed keen foresight of the possibilities of physical therapy and had much confidence in its future status. He contributed numerous articles and exhibits to the annual conventions and aided the association in its scientific progress.

As a roentgenologist, Dr. Tyler enjoyed prominence as a student of the science. His affiliation with most of the national organizations attested to his ability and professional standing. He was a teacher who was highly



regarded, having at one time occupied the professorial chair at Creighton Medical School.

The Congress was aware of Dr. Tyler's capabilities and in respect for his many contributions to physical therapy awarded him its gold key in 1932. This is the highest honor bestowed by the association.

Those of us who knew Dr. Tyler will always well remember him as a gentleman, a scholar and as a friend of medical science in general, and roentgenology and physical therapy in particular. His name should be indelibly written on the records of the society, for were it not for him the American Congress of Physical Therapy would be non-existent today.

It is with profound regret that we record this loss. To his family the officers and fellows of the Congress extend their sincerest sympathy.

---

#### FUNDAMENTALS, THE KEYNOTE OF THE INSTRUCTION COURSE FOR 1944

Physical medicine is a comparatively new field and its scope is wide. Because the specialty is comparatively new, knowledge of the sciences on which it is founded probably is not as widely disseminated as is true of such knowledge with respect to some of the other fields of medicine. However, in recent years considerable clinical and research work has been done to substantiate the usefulness of physical agents and procedures. Certainly in the immediate future, much more study and research will be inaugurated to increase relevant knowledge of biophysics, physiology and pathology and of the new physical procedures employed in this branch of medicine.

In the past, much of the didactic training of physicians in physical medicine has had to deal with generalities. This probably was due partly to the fact that some physical procedures were employed on empirical grounds since fundamental information was not available. In addition to lack of information on fundamentals, most physicians had received in medical school very little instruction in physical medicine, which is partly the reason for the superficial conception of the subject which most physicians held. Trying to teach physical medicine to physicians who have little fundamental knowledge of biophysics and the like is similar to the situation which would obtain if the attempt were made to teach medicine and surgery to students who never had been instructed in the basic medical sciences. Thus far, in the development of physical medicine, sufficient time has not been available to give detailed courses of instruction in biophysics to physicians who were already trained otherwise. Because physicians lack knowledge of the field of physical medicine, it has been necessary to inform them that there is such a branch and that it is becoming of increasing importance. The medical profession is now more aware of this specialty than formerly it was, and more basic, specific subjects might be incorporated in courses of instruction for physicians who were interested in, and who are aware of, what is involved in physical medicine.

Physicians now are interested in "why" and "how" physical agents are used as well as in "for what." They wish to know more than merely the indications for physical medicine in certain diseases; they wish to be able to order the procedures intelligently. As time goes on, it will become more and more imperative that the physician who practices physical medicine know the fundamentals of the effects resulting from use of the procedures he employs as well as how these procedures are carried out. The physician should not have to rely on the knowledge of his technical aide. He should

know the exact technic to be used. He certainly should know more about physical medicine than the technician knows. For instance, when massage is indicated, he should not issue a general order reading only "massage"—as many orders seem to be written—and leave the type of massage to be given to the judgment of his technician. The physician should know why massage is indicated at all and the type of massage that is suitable in the case and he should give specific orders. All of the facts concerning the effects of massage may not be known to anyone but the physician should be acquainted with what is known. As long as he relegates procedures of massage to technicians, without himself knowing the physiologic effects, standards of technic and the like, massage may continue to be just rubbing.

Another instance in which basic knowledge of effects is necessary is that of the application of heat. There are any number of agents available for the application of heat. However, for these to be used intelligently, the physician should know why in one case he orders radiant heat from a luminous source rather than from a nonluminous source, why in another case he uses moist heat rather than dry heat, why certain lamps may be efficient in certain instances and not efficient in others from a physical and mechanical standpoint. Some of these things are somewhat controversial but, on the other hand, it is only through the stimulation of thought in regard to the efficiency of these elements that the whole field of physical medicine may be put on a truly scientific basis.

The statement that a physician should know the technics to be used seems farfetched. Yet a physician would not think of telling a nurse to give medicine for pain without saying how much, what kind and how often. Many times orders are given by physicians to technicians in physical therapy which consist of broad directions such as "baking, massage and exercise," with no specifications as to what kind, how much, how long or how often.

In the future, it would seem wise to present basic, fundamental information concerning specific subjects in the courses of instruction in physical medicine. This will be necessary to keep pace with the fundamental work that undoubtedly will be done as a result of the recent stimulus given to the field of physical medicine by the Baruch Committee.

In the past, there has been considerable interest in the course of instruction in physical medicine given at the meetings of the American Congress of Physical Therapy. Therefore this course is to be continued at the meeting of the Congress in Cleveland in September of this year. Every attempt is being made to present a roster of lectures, discussions and demonstrations which will be more or less basic, technical and specific. A completed schedule of the topics to be discussed or demonstrations to be given during these courses will be published in the near future in the ARCHIVES.

---

#### COLONEL FRANK BOLLES WAKEMAN

Colonel Frank Bolles Wakeman, Director of the training division of the Office of the Surgeon General of the United States Army and organizer of the training courses for officers of the medical corps, died suddenly in Washington on March 16.

Colonel Wakeman, who was born in 1896, graduated from Indiana University School of Medicine in 1926. He was a Fellow of the American Medical Association, a Certified Specialist in Clinical Pathology and a member of the Society of American Bacteriologists.

Since the outbreak of the war, Colonel Wakeman had given constantly

of his tremendous energy in order to establish suitable training courses for medical officers as well as for technicians and for the personnel of the medical administrative corps. He had a special interest in physical therapy from the time that he, then a young medical officer, served as head of the department of physical therapy at the Walter Reed Hospital. He served for some time as a member of the Central Physical Therapy Board in the Office of the Surgeon General of the Army. He co-operated in the organization of emergency training courses for physical therapy technicians and was instrumental in the development of the plan for training of members of the Women's Army Corps to serve as physical therapy technicians. Colonel Wakeman also organized the courses for training of physical therapy physicians to head departments of physical therapy in army hospitals. With the passing of Colonel Wakeman, physical therapy loses a great and good friend who, because of his enormous vitality, made significant contributions to the proper advancement of physical therapy.

Colonel Wakeman's genial and lovable personality, plus his great physical stamina, endeared him to all of his friends. He was truly a man's man and it is obvious that he gave his life in the service of his country because he would permit no curtailment of his activities despite the fact that his arduous duties had become a constant drain on his physical vitality. Deprived of his wish to be in the thick of the battle on the fighting front, he gave unstintingly of himself to perform an even more important task as a great organizer in the Office of the Surgeon General.

Colonel Wakeman literally gave his life in the organization of the extensive medical training program which will be of untold benefit to generations yet to come.

---

## OCCUPATIONAL THERAPY A PART OF PHYSICAL MEDICINE

It has been the practice in the past to place occupational therapy under the nominal medical supervision of any one of several departments, such as neuropsychiatry, orthopedics, or physical medicine. Occupational therapy is being considered now as a phase of physical medicine. Therefore, it is recommended that schools of occupational therapy and departments of occupational therapy should be under direct supervision of a physician who has specialized in physical medicine, preferably a member of the Society of Physical Therapy Physicians, who is director of the department of physical medicine in the particular institution.

---

### CORRESPONDENCE

#### "Physiatrist" vs. Physical Therapist

*To the Editor:* I have been interested in the letter of Capt. Zankel. I devoutly pray that the terms suggested by him will never be adopted. They are cacophonous, and could easily be confused with a defunct sect of medical practice. If there is a need for a descriptive title of one

practicing the specialty, Physiatrist would be the logical one, and physiatrics would be the proper name for the specialty; the same Greek ending for phychiatry and pediatrics. The word is from the Greek, indicating physician, and the compound word indicates the physician specializing in physical medicine.

VINCENT A. LAPENTA, M.D.

## THE STORY OF THE KENNY METHOD

**BASIL O'CONNOR, President**

**The National Foundation for Infantile Paralysis**

**NEW YORK, N. Y.**

Just three and a half years ago—in 1940—a distinct change in our treatment of infantile paralysis was introduced, one that has since caught the public's attention because of its human drama. This was, of course, the method of treating infantile paralysis victims which was evolved by Sister Kenny, the Australian nurse.

Many have misunderstood the nature of the Kenny treatment, and have thought it a cure for infantile paralysis. That is not true, and Sister Kenny makes no such claim. There is no cure for this crippling disease. The medical profession is still in the dark as to how to prevent it. It cannot control its spread. No one yet knows by what method this virus is carried from one victim to another. In a day when we are masters of malaria, smallpox, and diphtheria—infantile paralysis is still a riddle, a mystery, a crippling menace prowling our country at will.

What Sister Kenny has contributed, however—and it is a very real contribution—is a method for treating victims already stricken by infantile paralysis; a method that in the opinion of many American doctors reduces the crippling after-effects of the disease.

There is a real interest in the history of the Kenny method in this country, and The National Foundation for Infantile Paralysis played an all-important part in evaluating this technic and in making it available to every infantile paralysis victim.

Sister Kenny went to the offices of the National Foundation one day in May, 1940, because she knew that the job of the National Foundation was to examine and study every new bit of knowledge that could possibly hasten the conquest of infantile paralysis. Present that day, were Sister Kenny, the President of the National Foundation and its Medical Director. Sister Kenny told how she had first developed her method. Thirty years ago, as a young nurse in the Australian bush country, without medical assistance she had to care for a child stricken with infantile paralysis. Instead of immobilizing her patient's paralyzed limbs in casts or splints, she worked out a method of easing the pain and tightness in the muscles by frequent applications of heat—strips of woolen material were wrung out of steaming hot water. As the pain subsided she followed this with passive exercise until the patient himself could move his limbs. She felt that in many cases, this treatment had prevented many of the crippling after-effects of the disease.

Sister Kenny was anxious that the National Foundation subject her method to scientific check, and so was the National Foundation. A few weeks later, when the University of Minnesota asked the National Foundation to support a program to study the Kenny method, it readily made a grant to that institution to enable Sister Kenny to demonstrate her method, and to give the physicians at Minneapolis a chance to see her work. For the next six or seven months, Sister Kenny treated infantile paralysis patients in Minneapolis.

In January of 1941, the National Foundation received a preliminary report from the doctors at the University. They were strongly impressed by



what they had seen. To be sure, the number of cases studied had been few — too few to justify definite conclusions, but the physicians supervising this study felt that the patients treated had made far better recoveries than was usual in their experience. They recommended further study.

There was one fact, not widely known, that made these physicians cautious in their judgment. And that was the fact that over 50 per cent of all infantile paralysis cases seemingly recover by themselves, without any special form of treatment! "How do we know," these physicians asked, "that many of these cases Sister Kenny has treated might not have been among those that would have recovered spontaneously?" Obviously no one could answer that question, but medical science and the National Foundation had to take that factor into account.

The caution of these physicians making their first study of the Kenny method was justified on other grounds, too. They had seen many hopeful methods for treating infantile paralysis tried before — methods which failed to stand up under scientific test. Before they gave the Kenny method their full approval, they had to be sure.

That is why in 1941, the National Foundation made a second grant to the University of Minnesota to make further studies of the Kenny method. Nearly one hundred patients were treated the following year. In December of 1941 the medical men of the University made a second report. After consideration of this report, the Medical Advisory Committee of the National Foundation declared:

"It is the opinion of this committee that during the early stages of infantile paralysis the length of time during which pain and tenderness are present is greatly reduced, and contractures caused by muscle shortening during this period are prevented by the Kenny method. The general physical condition of the patient receiving this treatment," said the committee, "seems to be better than that of patients treated by some of the other methods during a comparable period."

It was on the basis of this report that The National Foundation for Infantile Paralysis felt justified in opening the throttle and going full steam ahead to make this Kenny method of treating infantile paralysis available everywhere in the land. A plan was immediately set up to instruct and train physicians, nurses and physical therapy technicians. Sister Kenny herself was to help in the teaching at the University of Minnesota.

How well this has worked was clearly demonstrated during the epidemics of 1943 when 12,401 cases were reported. The physicians of the whole nation had learned something of the work; many were intimately acquainted with it. Physical therapy technicians and nurses had been trained to do the work. From the epidemic areas of the West, the Central States and the East came a flood of requests from physicians for more technicians and more nurses to give this treatment.

Here was proof of the endorsement of the method by American medicine! Patients could be treated from coast to coast. Private physicians, clinics, hospitals and departments of health called for more skilled workers. The supply was limited by the demands placed on this country by war; yet there were enough to do a good job.

Up to the present time, a total of 900 persons have received this training at the University of Minnesota alone, and have been graduated with the approval and certification of Sister Kenny.

All of this has been tremendously costly — a cost borne entirely by the National Foundation. To date, \$107,000 has been given by the National



Foundation to the University of Minnesota alone, to further the evaluation and teaching of the Kenny method. Every sum this University has ever requested has been granted in full by the National Foundation.

But the task of teaching the number of technicians needed to serve the whole country was too great for any one school. So the National Foundation opened other centers. Institutions in California, Illinois, Indiana, Georgia, Pennsylvania and New York took up the teaching of the Kenny method. In addition to the money given to the University of Minnesota, \$140,000 has been granted to the other schools. These grants were made to schools connected with or operated by medical teaching centers. Eight medical colleges and one hospital devoted solely to treating infantile paralysis and to training professional people took up the burden of making the special skills and knowledge available to all physicians, nurses and physical therapy technicians. There was no quarrel here between American medicine and new methods of alleviating suffering and crippling from infantile paralysis!

The National Foundation has spent additional money on scholarships, wool for treatment, distribution of literature, exhibits and demonstrations — a total of \$301,000!

In fact — and it is one worth remembering — in the past three years the National Foundation and its Chapters have spent a total of over a half million dollars of your money for the study and teaching of the Kenny method! It is no exaggeration to state that in all the history of medicine, few new theories have ever received such generous financial support from the people of any nation.

In addition to all of the foregoing, two five-year grants have been made recently by your National Foundation: one for \$175,000 to the University of Minnesota to study the physiologic problems concerning the mechanism of infantile paralysis and methods of treatment; the other grant of \$150,000 was made to the University of Pennsylvania to establish a center for research and instruction in physical medicine. Both of these grants permit further evaluation and teaching of the Kenny method.

It is the dimes and dollars of the American people that have made this possible — the dimes and dollars they have contributed each year to the March of Dimes. And those dimes have done good work. Last year, the third greatest epidemic in the recorded history of the disease in the United States struck our country. Had it not been for the hundreds of physicians, nurses and technicians trained with the public's money and ready to administer the Kenny method promptly, that epidemic might have resulted in a national disaster.

It is obvious, of course, that this newer type of treatment is far more costly, in money and personnel, than the older systems of handling polio victims. Heretofore, patients were usually immobilized in splints and plaster casts and could be cared for by a small staff of physicians, nurses and technicians. The physical therapy given usually consisted of a few hours of treatment a week — and that frequently was administered only late in the disease.

With the Kenny method, all that is different. Our medical men, in their own language, describe the Kenny method this way — "It is the early use of physical therapy, designed to prevent unnecessary deformities and to bring about the maximum function of such nerves and muscles as may have been spared by the disease process."

That means that each patient must have far more individual attention. Each case must have hot packs applied every hour or two for at least twelve hours of the day during the acute stages of the disease. At the same time, the passive exercise and reeducation of the patient's muscles must be started.

Just consider the personnel required to provide such care under epidemic conditions! Consider, too, the soaring cost of such treatment!

Progress is being made in the fight against infantile paralysis. The Kenny method definitely represents an important step forward in our treatment of this disease. But the fact that it isn't a cure and it isn't fully developed must be borne in mind.

There are some cases that can't be helped at the present time by any known method of treatment, whether it be the Kenny method or any other. These are the victims whose nerve cells have been completely destroyed by the ravages of the disease. To them, motion in some muscles has been denied forever! It is for these cases, particularly, that the research programs of the National Foundation, designed to find a way to prevent the disease, must go on.

Unfortunately, no one has yet been able to find a cure for infantile paralysis. Studies are constantly being pursued along this line by the National Foundation, but so far without result. There is no known drug or serum or vaccine to combat the virus that causes the disease. But, in the meantime, both the amount and kind of palliative treatment have been improved.

How such treatment methods can be best taught and made available to the people is a matter about which there is a difference of opinion. The establishment of a Kenny institute in Minneapolis as the only place where the Kenny method would be taught has been suggested. But, of course, it's impossible to train all the Kenny technicians we require at any one place—in Minneapolis or elsewhere. And it would be equally impossible for any one person to supervise the various centers of teaching now supported by The National Foundation for Infantile Paralysis.

The ultimate aim is to make whatever is sound in the Kenny method a part of the curriculum of every medical, nursing and physical therapy school in the country—and that aim will be accomplished. No one institution can have a monopoly on the teaching of the Kenny method. While it is Sister Kenny's contribution to humanity, for humanity's sake it must be available to all.

This history of the Kenny method shows very clearly that your National Foundation stands ready to evaluate and test and make available every method of treatment that promises to loosen the grip that infantile paralysis has on our children. If, on the basis of tests made, a method is found effective, the full resources of The National Foundation for Infantile Paralysis will be thrown behind it. The half million dollars of your money spent on the Kenny method to date certainly proves that.

The National Foundation for Infantile Paralysis is your Foundation—a Foundation dedicated to one purpose and one purpose only—final and complete conquest of infantile paralysis.

Until that conquest is made, the National Foundation will carry on the most ambitious research program every marshalled against any disease. It will also continue to provide hospitalization and medical care, including the Kenny treatment, in every community to every infantile paralysis victim who needs it. And it will continue to evaluate and aid every new method that is brought to its attention.

It is the people of America who have made all that possible.

## MEDICAL NEWS

### Physical Therapy Part of Program of War-Time Graduate Medical Meetings

Major Ben L. Boynton spoke on the subject of "Physical Therapy in War Wounded," on March 29 at Camp Pickett, Virginia.

Lieutenant Commander Jacob L. Rudd presented the subject "Treatment of War Wounded in Naval Hospital Physical Therapy Department," on March 15 and 22 at Fort Monmouth, N. J.; "Physical Therapy" was his subject presented March 17 at the Philadelphia Naval Hospital.

Dr. Franklin P. Lowry was in charge on a symposium on physical therapy at the Dispensary, U. S. Naval Air Station, Brunswick, Maine, March 16.

Dr. A. A. Martucci presented the subject "Ultraviolet Therapy" and Dr. Leonard D. Frescoln, "Posture, Physical Exercise and Massage" at Fort Monmouth, N. J., March 22.

Dr. Paul C. Collona spoke on "Low Back Pain" at the England General Hospital, Atlantic City, N. J., March 21.

The surgical staff of Lovell General Hospital, Fort Devens, Mass., presented a conference on military surgery March 30, 1944. As a part of the program Capt. Sidney Licht gave a clinic on rehabilitation of the wounded soldier.

Dr. Ralph Pemberton will speak at Ashford General Hospital, White Sulphur Springs, W. Va., April 10 on the subject of "Arthritis."

Dr. Philip D. Wilson will speak on "Low Back Pain," April 11, at Halloran General Hospital, Staten Island, N. Y.

most needed for general use. They are listed in Schedule A of the order, as follows: electric bakers, fever cabinets, galvanic generators, infra-red generators, low voltage generators, magnetic field generators, medical diathermy units, passive vascular exercise apparatus, surgical diathermy units, ultraviolet radiation equipment and whirlpool baths.

These items may be sold to the armed services, to lend-lease, for licensed export orders, to hospitals and medical departments of industrial concerns, medical practitioners, and to distributors for delivery for these users.

Three types of equipment in Schedule A (electric bakers, infra-red generator and ultraviolet radiation equipment) may be sold or rented to the public on written prescription of a medical practitioner licensed to use physical therapy equipment.

Formerly, the only types that could be made for civilian use (hospitals) were electric bakers, fever cabinets, major ultraviolet radiation equipment, passive vascular exercise apparatus and surgical diathermy units.

Monthly scheduling reports are no longer required from manufacturers. However, quarterly reports of shipments of electric bakers, infra-red generators, and ultraviolet radiation equipment to purchasers other than the armed services and lend-lease must be made by manufacturers. One combined dollar value figure is required.

Distribution controls established by the order are designed to place the equipment that may now be manufactured in the hands of those having an urgent need for it, WPB said.

### Order L-259 Amended by War Production Board

Restrictions on the manufacture and sale of physical therapy equipment were eased today by the War Production Board. Medical practitioners and hospitals may now buy certain types of equipment that formerly were manufactured only for the armed services and lend-lease, and medical practitioners may also buy other types formerly restricted to these groups and to hospitals, WPB announced. In addition three types of physical therapy equipment, generally approved by the medical profession for home use, may now be sold to the public on prescription or order of a licensed medical practitioner.

Action was taken today by amending Order L-259 (Physical Therapy Equipment). The order as issued in February, 1943, placed strict control on production and distribution of this equipment and prohibited the manufacture of most types except for the armed services and lend-lease.

Types that may now be manufactured are those

### Training of Occupational Therapy Technicians \*

At the 1933 session of the House of Delegates of the American Medical Association a resolution was introduced that some plans be effected for the establishment of standards, ratings and inspections of training schools for occupational therapy technicians. This program was referred to the Council on Medical Education and Hospitals, and all of the 13 existing schools were surveyed. The Essentials of an Acceptable School of Occupational Therapy were ratified by the House of Delegates of the American Medical Association at the Atlantic City session in 1935, such standards to become effective on Jan. 1, 1939. A report of the Council on Medical Education and Hospitals to the House of Delegates in 1936 contained the names of 4 schools which had already met these standards. There are currently 13 schools on the approved list.

\* Reprinted with permission, J. A. M. A. 124:1917 (March 25) 1944.

Six schools for occupational therapy technicians were approved last year. An equal number of schools have started classes and will be ready for consideration in the next year or two. Interest in creating new schools has resulted in the sudden expansion of occupational therapy departments in the hospitals maintained by the armed forces. Graduates of the approved schools are eligible for U. S. Civil Service appointments in Army hospitals.

In the calendar year of 1942, 146 students were graduated by the 7 approved schools. There were 162 graduates in 1943. Five of the 13 currently approved schools will have their first graduates during 1944.

Anticipated graduates for 1944 total 218 in the approved schools and 14 in the recently established schools. Emphasis has been placed on increasing the student enrollment in regular and advanced standing courses. Also several of the schools have accelerated their training programs by offering three semesters each year. These factors might make it possible to graduate more than the anticipated number of 232 during 1944. However, the maximum capacity of all schools totals 553 for the senior year plus 172 for the short or advanced standing courses. Thus a maximum of 725 students could be trained next year by the approved schools and those new schools which will probably be considered during the year. It appears that enrollment equaling the present maximum capacity of all schools will be necessary to satisfy Army needs for the next two years. Requirements of civilian hospitals, Veterans Administration facilities, rehabilitation programs and others will create an extra demand. The total needs will greatly exceed the maximum capacity of all schools.

The long period which is necessary to train prospective graduates adequately in the arts, crafts, biologic sciences and medical subjects handicaps the efforts to produce large numbers of occupational therapy technicians in a short time. Advanced standing courses open to individuals who have had sufficient collegiate training in the arts and crafts require from sixteen to twenty-one months instruction and experience before these students are thoroughly qualified. Instruction is on the college level in all but one school, and the instruction there appears to be very similar to that found in many accredited colleges.

### Training of Physical Therapy Technicians \*

The House of Delegates of the American Medical Association in 1934 requested that some plan be effected for the establishment of standards, ratings and inspections of schools for the training of physical therapy technicians. The Council on Medical Education and Hospitals assumed responsibility for this program and by 1936 had completed a survey of these schools. Certain minimum standards were formulated. These were presented to the House of Delegates of the American Medical Association and were ratified in May 1936. The first published list of 13 approved schools for physical therapy technicians

\* Reprinted with permission, J. A. M. A. 124:917 (March 25) 1944.

(For list of accredited schools for occupational and physical therapy technicians, see pages 254 and 255, this issue.)

appeared in *The Journal* in August 1936. At present there are 28 approved schools.

Six month emergency courses continue to be popular. The 17 schools approved for this type of training produced 235 physical therapy aides last year. After obtaining an additional six months of experience in army hospitals, these students are eligible for registration examinations. Individuals who are planning to work in civilian hospitals should not take the emergency course but should enroll in the regular course, which is presented in nine or more months of instruction. The 23 schools offering the regular course graduated 190 students in 1943. Emergency and regular programs trained 435 students, or an increase of only 9 over the previous year.

Army needs for properly trained physical therapy technicians or aides were much greater than the total graduates. Estimates of Army and Navy needs for the current year are over twice the present number of graduates. In fact the needs exceed not only the 719 anticipated graduates during 1944 but also the maximum capacity of both the regular and the emergency courses, or 816 students. Next year the Veterans Administration and rehabilitation programs will probably require equally large numbers of graduates. To meet these demands there must be more schools approved, and greater effort will be required to encourage more students to enroll.

Only four of the approved schools require more than the minimum entrance requirements of two years of college credit. Ten of the schools have courses arranged so the students can receive from 20 to 50 semester hours of credit toward a degree, while one four year program grants 131 credits. Tuition is not charged for seven of the emergency courses and three of the regular curriculums. A total of 220 graduates were produced by these ten courses. Other schools charge from \$72 to \$432 a year, but many of the higher tuitions are university fees. The mean tuition of all emergency courses remains at \$200, while the average has dropped to \$132. Tuition for the regular curriculum averages \$212, while the mean is \$200.

Universities, medical schools, colleges or hospitals having suitable facilities in physical therapy are urged to consider the establishment of acceptable programs in this field.

For further information regarding the approval of technical courses, communicate with the Council on Medical Education and Hospitals. Individuals desiring registration should write to the American Registry of Physical Therapy Technicians, 30 North Michigan Avenue, Chicago 2.

### Clinical Practice for Emergency Course Students More Clearly Defined

*Dr. Victor Johnson, Secretary of the Council on Medical Education and Hospitals of the American Medical Association, sent the following letter to all approved schools for physical therapy technicians:*

A few instances of schools sending their emergency course physical therapy students to unaffiliated civilian hospitals for additional practical experiences have been reported to the Council. Claims have been made that some of these stu-



dents were released from their schools to gain practical experience in civilian hospitals or physicians' offices on a salary basis.

The emergency course was designed to prepare large numbers of physical therapy aides for the armed forces. Students who cannot pass physical examination requirements of the Physical Therapy Corps or who do not care to obtain their practical training in the Army should *not* be enrolled in emergency courses but in the regular course which provides a minimum of nine months of instruction and supervised experience in hospitals affiliated with the school for the training of classes in physical therapy.

Approved schools may also be approved for the emergency course if students can receive all of the didactic curriculum and at least 200 hours of supervised clinical practice within six or more months. These students may then be released to Army hospitals for an additional six months of practical experience. Only after this additional six months of Army experience should the school issue a certificate, diploma, degree or letter to the students.

It is acceptable for both regular and emergency classes to receive their six months of didactic instruction simultaneously. Those students not released to the Army should be retained for at least three more months of training before being graduated.

#### Dr. Piersol to Speak on Physical Therapy

The Woman's Auxiliary of the Philadelphia County Medical Society will sponsor its fourteenth annual health institute, April 11, at the Philadelphia County Medical Society. "Health Trends" will be the theme of the program.

Dr. George Morris Piersol will take part in the program and present a paper entitled "Plans for New Developments in Physical Therapy."

#### Dr. Northway on Stanford Program

The Sixty-second Course of Popular Medical Lectures sponsored by The Stanford University School of Medicine will be given at Lane Hall, March 17, March 31, April 14 and April 28.

Dr. William H. Northway gave the lecture scheduled for March 17 and presented the subject "Treatment of Infantile Paralysis."

#### Graduation Exercises for Technicians Northwestern University

Graduation exercises for the class of physical therapy technicians of Northwestern University Medical School were held in the auditorium of Thorne Hall, March 22. Colonel Don Hildrup, Surgeon of the 6th Service Command of the United States Army gave the address to the graduating class. Following these exercises a special ceremony was held to dedicate a Service Flag in honor of the forty-seven graduates of the Northwestern University Physical Therapy Course who are serving with the Armed Forces.

#### D. T. Watson School of Physical Therapy

Preliminary commencement exercises were held Friday, April 7, at Sunny Hill, Leetsdale, Pa., for the class of 1944, Women's Army Corps. The program follows:

- "Marche Militaire" - - - - Schubert
- Miss Margaret E. Rae
- (Entrance of Class of 1944, Women's Army Corps)
- Lieutenant Elizabeth A. Dean, C.O.
- National Anthem
- Invocation
- The Very Reverend James A. Reeves,  
A.M., S.T.D., Litt.D.  
President, Seton Hill College
- Remarks
- Mr. Harry F. Stambaugh  
President, Board of Directors
- Purpose of Preliminary Exercises
- Doctor Jessie Wright  
Director, School of Physical Therapy
- Selection—Theme from
- "Warsaw Concerto" - - - Addinsell
- Miss Margaret E. Rae
- Address—"Importance of Physical Therapy  
in Rehabilitation"
- Colonel A. S. Dabney  
Assistant Dean, School of Medicine  
University of Pittsburgh
- Selection—"Nocturne" - - - - Chopin
- Miss Margaret E. Rae
- Presentation of Provisional Diplomas
- Major Emma E. Vogel, A.U.S.  
Director of Physical Therapy Aides  
Office of the Surgeon General
- Selection—"Clair de Lune" - - - Debussy
- Miss Margaret E. Rae

#### Dr. MacEachern Receives New Appointment

Dr. Malcolm T. MacEachern has recently been appointed as associate professor of medicine, Northwestern University Medical School.

#### News From Lieut. Col. Deyoung

Lieut. Col. Edward M. Deyoung, who has been in Hawaii, has been assigned as Executive Officer, Army Service Forces, Glennan General Hospital, Okmulgee, Oklahoma. While in Hawaii, Col. Deyoung was the Physical Therapy Consultant and had many interesting experiences and problems while on this assignment.

#### National Society for Crippled Children

This society issues monthly a Bulletin on Current Literature of interest to crippled children workers. It is sent to affiliated state and local societies for crippled children, state agencies engaged in the treatment, education or vocational rehabilitation of crippled children.



ples and public or private institutions and agencies have Institutional Membership in the National Society for Crippled Children. It is available to other persons and agencies who pay 50 cents a year to cover actual cost of materials and postage. Any publication or article listed in the bulletin may be borrowed free of charge from the Bureau of Information of the National Society for Crippled Children, Elyria, Ohio.

---

### National Conference of Social Work and Associate Groups

The 71st Annual Meeting of the National Conference of Social Work and Associate Groups will be held in Cleveland, Ohio, May 21 to 27, with headquarters at the Hotel Cleveland.

---

### H. G. Fischer Recovering

We are happy to report that Mr. H. G. Fischer is recovering from a very serious automobile accident in which he and Mrs. Fischer narrowly escaped death. The ARCHIVES has received long and continuous support from the H. G. Fischer Company. A speedy and complete recovery is the wish of our staff and their many friends.

---

### Diploma in Physical Medicine

A diploma in Physical Medicine is to be granted jointly by the Royal College of Physicians and Surgeons. Requirements for admission to examination are (1) three years practice and hospital affiliations and twelve months full time special study in specialty. There will be an examination given in two parts. The first examination will be given in July, 1944.

---

### Study of Non-Ionising Radiations

The medical research council has appointed a committee to advise and assist in promoting the quantitative study of non-ionising radiations, particularly in relation to their medical applications. Infra-red, visible and short wave wireless radiations are to be considered, possibly also ultraviolet and ultrasonic radiations.

---

### The Artificial Limb Center at Roehampton

The little Surrey village of Roehampton has become famous as the greatest center in Britain for the manufacture and fitting of artificial limbs. Thanks largely to Roehampton the modern artificial limb is of light and simple construction, permitting leg movements scarcely distinguishable from the natural gait. This highly specialized craft has been so perfected that the time between amputation and return to more or less normal life is greatly reduced. Provision is also made for occupational therapy, with gymnasium and workshops, and for the patient's economic and recreational rehabilitation.

---

### Industrial Health Conference

The Indiana State Medical Association will conduct its second industrial health conference at the Indiana University School of Medicine, Indianapolis, April 19-20. Among those on the program will be Dr. Harold A. Vonachen, Peoria, Ill., who will speak on the subject of "Community Organization for Rehabilitation and Reemployment."

---

### National Council on Rehabilitation

The annual meeting of the National Council on Rehabilitation has been set for June 5 and 6, 1944, and will be held at the Ritz-Carlton Hotel, Madison Avenue and 45th Street, New York City in the Carlton Suite from 9:30 A. M. to 4:30 P. M.

The Council has issued in March, Number 1, Volume 1 of their "News Letter." Anyone interested can be placed on the mailing list by so requesting in writing to their headquarters, 1790 Broadway, New York 19, N. Y.

---

### Post-War Jobs in Vocational Rehabilitation

Returning soldiers, ex-war workers, students, teachers, parents, counselors, and others who want to know about professional opportunities in helping injured persons to reestablish themselves economically, will want to read the composite summary of available literature on "Vocational Rehabilitation as a Career" just completed by Sarah Allen Beard and published by Occupational Index, Inc., New York University, New York 3, N. Y. Single copies are 25c cash with order.

This is the fourth in a new series of Occupational Abstracts, covering occupations in which post-war employment prospects are good. The editor of the series is Professor Robert Hoppock of New York University. Advance orders for the next 10 in the series may be placed now at \$2.50.

---

### Best Books of 1943

Librarians, counselors, deans, teachers, school administrators, employment interviewers and vocational rehabilitation officers will be interested in "Best Books of 1943 on Occupational Information and Guidance," a new selection by Robert Hoppock, Kathleen Pendergast, Elizabeth Rosso, and Samuel Spiegler, just released by Occupational Index, Inc., at New York University, New York 3, N. Y. Single copies are 25c, cash with order.

The 41 titles are arranged in suggested order of purchase with 20 free and inexpensive pamphlets listed first.

---

### Center for Treatment of Arthritis

A center for the diagnosis and treatment of arthritis has been set up at the Army and Navy General Hospital, Hot Springs National Park, Ark., the War

Department recently announced. All patients with severe and prolonged arthritis to be treated by the Army will be sent to the hospital, which is specially equipped for treatment of diseases of the joints and has facilities for extensive physical therapy. Lieut. Colonel Philip Hench, formerly of the Mayo Clinic, is in charge of medical service at the hospital. Dr. Hench is a leading specialist and an authority on diseases of the joints. While arthritis does not account for a large percentage of illnesses in the Army, it is found to be one of the most disabling.

### Reconditioning Conference at Schick General Hospital

A sound program for the reconditioning of disabled soldiers, recently announced by the Surgeon General of the Army, was given great impetus in a two day conference held at the Schick General Hospital, Clinton, Iowa, in March. Medical corps officers and others in attendance were impressed by the scientific approach to the problem.

Reconditioning, though not a new concept to physicians, has been carefully planned to include all phases of the problem. Last year the Surgeon General, after a thorough study of the problem, created a new division in his office, the Reconditioning Division, and appointed Col. Augustus Thorndike, M. C., as its director. Colonel Thorndike was formerly Surgeon in the Department of Hygiene, Harvard University where he had practical experience with athletes. He is the author of a well known book dealing with the care of injuries of athletes and is singularly fitted for the new post.

### Council Approval for Physical Therapy Courses

The Council on Medical Education and Hospitals of the American Medical Association has extended its approval for the following courses for physical therapy technicians:

Columbia University, regular nine - month course.

University of Texas School of Medicine, Galveston, Texas, regular nine-month course.

The following six-month emergency courses, approval extended for duration of the present emergency:

Richmond Professional Institute of Richmond, Virginia.

St. Louis University School of Nursing, St. Louis, Missouri.

### Conference on Convalescence and Rehabilitation

Conference on Convalescence and Rehabilitation, the New York Academy of Medicine, April 25th and 26th, under the auspices of the Committee on Public Health Relations with the support of the Josiah Macy, Jr. Foundation —

Tuesday, April 25th

I Morning Session—Chairman,  
Oswald R. Jones, M.D.

9:15 Arthur F. Chace, M.D., President of the Academy—Address of Welcome.

9:30 Oswald R. Jones, M.D., Chairman of the Committee on Arrangements—Opening Address.

9:45 William S. Tillett, M.D.—“The Medical Problems of Convalescence.”

11:00-12:15 Presentation on behalf of the U. S. Navy.

Captain Frederick A. Jostes—“The Rehabilitation Plan of the Medical Department of the U. S. Navy”; Commander Francis J. Braceland—“The Role of the Psychiatrist in a General Rehabilitation Program”; Captain Camille M. Shaar—“Physical Reconstruction: Its Part in a Rehabilitation Program” (Slides).

12:15-12:45 Questions and General Discussion.

II Afternoon Session—Chairman,

I. Ogden Woodruff, M.D.

2:15- 3:15 Presentation on behalf of the U. S. Army. Colonel Augustus Thorndike—“The Reconditioning of Patients in Army Service Force Hospitals.”

3:15- 4:30 Presentation on behalf of the U. S. Public Health Service.

Senior Surgeon H. E. Hilleboe; Surgeon (R) Dean A. Clark; Senior Surgeon (R) Daniel Blain.

4:30- 5:00 Presentation on behalf of the Veterans Administration.

Lieutenant Colonel John R. Boswell; Mr. William A. Gillcrist, Chief of Vocational Rehabilitation.

III Evening Session—Chairman,

Colonel George Baehr

8:00 Presentation on behalf of the Army Air Forces.

Lieutenant Colonel Howard A. Rusk—“Convalescent Training Program in the Army Air Forces”; George G. Deaver, M.D.—“Functional Education in Rehabilitation”; Lieutenant Colonel John M. Murray — “The Convalescent Care of Neuropsychiatric Patients in the Army Air Forces” (Motion Pictures to Illustrate Talk).

Wednesday, April 26th

IV Morning Session—Chairman,

Norman Jolliffe, M.D.

9:15-11:00 Nutrition—Tom D. Spies, M.D.

11:00-12:30 Community Resources — Elizabeth G. Gardiner, M.A. — “Convalescent Facilities in Greater New York”; Herman A. Zazeela, M.D.—“Relation Between Hospitals and Convalescent Institutions”; Hilda M. Torrop, R.N.—“The Place of the Practical Nurse in a Convalescent Program.”

V Afternoon Session—Chairman

S. Bernard Wortis, M.D.

2:00- 3:45 Retraining—John F. Johnson, M.D.—“The Place of Industry”; William B. Snow, M.D.—“Physical and Occupational Therapy”;

Colonel John N. Smith—"Vocational Guidance" (Motion Pictures to Illustrate Talk).

3:45- 5:30 Motivation—Edward A. Strecker, M.D.

VI Evening Session—Chairman,  
James Alexander Miller, M.D.

8:00 Program to be announced later.

### Federal Security Agency

Physical restoration for the handicapped, so that they may as nearly as possible approximate normal capacity, was called the basic need in vocational rehabilitation by Federal Security Administrator Paul V. McNutt at the first meeting of the Professional Advisory Committee of the Office of Vocational Rehabilitation held in Washington, Friday, March 3.

The committee, made up of 20 specialists in medical and allied fields, was appointed by Administrator McNutt to provide professional guidance in mapping the new State-Federal program for medical and surgical care under the Barden-LaFollette Act.

In opening the meeting, Mr. McNutt stressed the Federal Security Agency's desire to aid the States in providing physical restoration services which will conform to the high professional standards recognized by the national and State medical associations and by the hospital associations.

"To be able to count on themselves as workers," Mr. McNutt continued, "many of the disabled need more than vocational training, important as that is. They need medical care to restore as much physical capacity as possible. Doctors have long pointed out that tackling the complex problem of rehabilitation at any other point is putting the cart before the horse. Some of the States, too, have pioneered in providing for physical restoration, along with vocational training, for the handicapped. This service has now been recognized as an integral part of our national vocational rehabilitation program.

"We want to give the disabled—the men and women crippled in industry, or by accident or illness—a chance to fulfill their rights and duties as citizens and as self-supporting wage-earners. We want to do this because it is in line with the American way of looking out for ourselves. We want to do it now because war industry needs every hand that can help."

An estimated million and one-half persons may be eligible for rehabilitation under the program authorized by enactment of the Barden-LaFollette Bill last summer, according to Michael J. Shortley, Director, Office of Vocational Rehabilitation.

Reporting the total active case load as 91,000 for the current year, Mr. Shortley said: "The States indicate they will extend rehabilitation services to 110,000 disabled persons during the fiscal year 1945." The program is in operation in all 48 States, the District of Columbia, Hawaii and Puerto Rico. "Physical restoration rounds out vocational rehabilitation services. It gives us the chance," he said, "to do more things for more people."

The committee reviewed the basic plans, policies and regulations governing the program in a discussion led by Mr. Shortley.

Plans for organization were brought to the committee by Dr. Dean A. Clark, of the U. S. Public Health Service, who is Chief Medical Officer for the OVR. The committee is making recommendations for the advice of State Rehabilitation Agencies in the following areas of operation: the scope of physical restoration services; professional standards for physicians, hospitals and other facilities providing services under State programs; auxiliary services in the fields of medical-social work, nursing, psychiatric social work, and physical therapy; and definition of the policies and plans of various groups of disabilities.

Members of the committee represent the professional specialties most actively concerned in rehabilitation. They are as follows:

Rev. John W. Barrett, Chicago, Director of Catholic Hospitals, Archdiocese of Chicago.

Miss Harriet Bartlett, Boston, President, American Association of Medical Social Workers.

Dr. E. M. Bluestone, New York, Director, Montefiore Hospital.

Dr. Karl M. Bowman, San Francisco, President-Elect, American Psychiatric Association.

Dr. Roderick Brown, Pittsburgh, Tuberculosis Specialist.

Dr. Guy A. Caldwell, New Orleans, Secretary, American Board of Orthopedic Surgery.

Dr. John S. Coulter, Chicago, Member, Council on Physical Therapy, American Medical Association.

Dr. Purman Dorman, Seattle, Ophthalmologist.

Dr. Robert Elman, St. Louis, Associate Professor of Clinical Surgery, Washington University School of Medicine.

Miss Marjorie Fish, New York, in charge, Professional Courses in Occupational Therapy, Columbia University.

Lt. Col. Raymond Hussey, M.C., A.U.S., Baltimore, Director, Army Industrial Hygiene Laboratory.

Dr. Victor Johnson, Chicago, Secretary, Council on Medical Education and Hospitals, American Medical Association.

Dr. E. S. Mariette, Minneapolis, Medical Director and Superintendent, Glen Lake Sanatorium.

Dr. Horace Newhart, Minneapolis, Professor Emeritus of Otology, Rhinology, Laryngology, University of Minnesota Medical School.

Dr. Winthrop M. Phelps, Baltimore, Orthopedic Surgeon.

Miss Marian Randall, Washington, D. C., Chief Nurse, Medical Division, Office of Civilian Defense.

Dr. W. D. Stroud, Philadelphia, Member, Council on Industrial Health, American Medical Association.

Dr. V. P. W. Sydenstricker, Augusta, Ga., Professor of Medicine, University of Georgia School of Medicine.

Dr. H. A. Vonachen, Peoria, Medical Director, Caterpillar Tractor Co.

Frank J. Walter, Denver, President, American Hospital Association.

Also attending the meeting by invitation were these members of the Rehabilitation Advisory Council:

Dr. Kendall Emerson, New York, Managing Director, National Tuberculosis Association.

Dr. Carl M. Peterson, Chicago, Secretary, Council on Industrial Health, American Medical Association.

Dr. Donald C. Smelzer, Philadelphia, President-Elect, American Hospital Association.

Dr. George Stevenson, New York, Medical Director, National Committee for Mental Hygiene.

Miss Catherine Worthingham, Palo Alto, President, American Physiotherapy Association.

### Physical Therapy School Opened at McGill

A school for training physical therapy technicians has been opened at McGill University under the Faculty of Medicine, Montreal. Dr. Guy H. Fisk, medical director of the school of physical therapy, is director of the course and Miss M. Finley chief instructress. The entrance requirements are senior matriculation or its equivalent, and the course is of two years' duration with an additional six months'

hospital work. A university diploma will be granted at the completion of the course. Graduates are eligible for membership in the Canadian Physiotherapy Association.

### President of Illinois Medical Society Dies

Dr. George Washington Post, 59, President of the Illinois State Medical Society died March 3.

A Past-President of the Chicago Medical Society, Dr. Post attended the University of Illinois and was an associate professor of surgery at the university's college of medicine.

It will be recalled that Dr. Post participated in the formal opening session of the Congress at its recent annual session in Chicago.

### Sanford Robinson Gifford

We regret to announce the untimely death of Dr. Gifford, distinguished ophthalmologist, who died at the age of 52 after a short illness.

Dr. Gifford was a member of the Committee on Ophthalmic Devices of the Council on Physical Therapy of the American Medical Association.

## Physical Medicine In Neuropsychiatric Diseases — Knudson

(Continued from page 226)

6. Krusen, F. H.: Physical Medicine; the Employment of Physical Agents for Diagnosis and Therapy, Philadelphia, W. B. Saunders Company, 1941, 846 pp.
7. Lewin, Philip: Infantile Paralysis; Anterior Poliomyelitis, Philadelphia, W. B. Saunders Company, 1941, 372 pp.
8. Lewin, Philip: The Kenny Treatment of Infantile Paralysis During the Acute Stage, Illinois M. J. **81**:281 (Apr.) 1942.
9. Coulter, J. S.: In Reimann, H. A.: Treatment in General Medicine, Philadelphia, F. A. Davis Co., 1939, vol. 3, chap. 58, pp. 2538.
10. Wechsler, I. S.: A Textbook of Clinical Neurology with an Introduction to the History of Neurology, Ed. 5, Philadelphia, W. B. Saunders Company, 1943, 840 pp.
11. Bristow, Rowley: Discussion on Injuries to Peripheral Nerves, Proc. Roy. Soc. Med. **34**:513 (June) 1941.
12. Ulanski, Benjamin: Conservative Method of Treatment of Trigeminal Neuralgia (Preliminary Report), Arch. Phys. Therapy **18**:7 (Jan.) 1937.
13. Kovács, Richard: Evaluation of Physical Therapeutic Measures in Facial Paralysis, Arch. Phys. Therapy **22**:145 (Mar.) 1941.
14. Bourbon, O. P.: The Role of Physical Therapy in Facial Paralysis, Arch. Phys. Therapy **18**:290 (May) 1937.
15. Steegmann, A. T.: Physical Therapy in Treatment of Nervous Disorders, Arch. Phys. Therapy **23**:482 (Aug.) 1942.
16. Polmer, N. H.: Physical Measures in Traumatic and Functional Neuroses, Arch. Phys. Therapy **18**:704 (Nov.) 1937.
17. Jacobson, Edmund: Progressive Relaxation; A Physiological and Clinical Investigation of Muscular States and Their Significance in Psychology and Medical Practice, Chicago, University of Chicago Press, 1929, 428 pp.
18. Billings, E. G., and Collins, Marguerite E.: Some Psychiatric Implications of Massage, Physiotherapy Rev. **17**:51 (Mar.-Apr.) 1937.
19. Brooke, C. R.: Physical Measures in Rehabilitation, Arch. Phys. Therapy **22**:724 (Dec.) 1941.
20. Brooke, C. R.: Physical Measures in Treatment of Veterans, Arch. Phys. Therapy **23**:353 (June) 1942.
21. Halliday, J. L.: Psychologic Implications of Physical Therapy, Arch. Phys. Therapy **22**:261 (May) 1941.



## BOOK REVIEWS

**MEDICAL PHYSICS.** Editor-in-Chief, *Otto Glasser*, Ph.D., Head, Department of Biophysics, Cleveland Clinic Foundation; Professor of Biophysics, Frank E. Bunts Educational Institute; Consulting Biophysicist, University Hospitals of Cleveland, Cleveland, Ohio. Cloth. Pp. 1745, with illustrations. Price, \$18.00. Chicago: The Year Book Publishers, Inc., 1944.

The extent to which physics has become an important basic science in medicine is forcefully brought out in this volume. The work is extensive, carefully edited and embraces a variety of subjects. Two hundred and fifty-one specialists have written 257 separate articles dealing with medicine and its allied sciences in which physics plays an important role one way or another. There are some 1,383 cuts.

The volume is too large to be a handbook but it might well be called the one-volume encyclopedia on physics, illustrated with charts, diagrams, pictures and tables. The classified table of contents contains the following sections: Anatomy, Bacteriology, Biometrics, Biophysics, Dermatology, Hematology, Medicine, Neurology, Nuclear Physics, Ophthalmology, Optics, Orthopedics, Otolaryngology, Pathology, Pediatrics, Photography, Physical Chemistry, Physical Therapy, Physics (Instruments and Methods), Physiology, Radiology, Surgery, and Urology.

The chapters on physics and medicine are of particular interest to physicians engaged in the practice of physical therapy. Concerning physical therapy, the authors have paid particular attention to the most important aspects of the specialty; hence, the book qualifies as a ready and comprehensive reference on medical physics. Any physician who has had a course in college physics can find his way around in the mathematical presentation. Those who may not be interested in mathematics can skip over the formulas.

The publishers are to be congratulated for undertaking the publication of this outstanding contribution in this field. This book brings out the facts that physical agents are being rediscovered and employed intelligently as methods of diagnosing and treating disease.

**MEDICINE AND THE WAR.** Edited by *William H. Taliaferro*, Eliakim Hastings Moore Distinguished Service Professor of Parasitology, University of Chicago. Cloth. Pp. 193. Price, \$2.00. Chicago. University of Chicago Press, 1944.

This volume is a collection of lectures sponsored by the Charles R. Walgreen Foundation for the Study of American Institutions. The lectures were given by members of the faculty of the Division of the Biological Sciences of the University of Chicago. This volume describes in nontechnical language some of the important work that is being done today in connection with the medical care of the armed forces.

The lectures give a few timely high lights on the increasing and amazing role that the art and science of medicine have assumed in modern warfare. Professor Luckhardt gives an historic background for the study. He shows that Xenophon's army of ten thousand men had only eight physicians in attendance. Professor Paul R. Cannon writes on Food and the War and points out that every statement relative to the effects of famine in war will apply with equal force after the war. He quotes a statement that at the end of the war we shall find a relatively vigorous Germany surrounded by peoples so weakened by starvation as to present an inevitable drawback to after war plans. Professor Geiling writing on Chemotherapy calls to our attention that the discovery of the sulfonamide drugs has marked the beginning of a new era in medicine. He also writes on penicillin and tyrothricin and its derivatives. In the article on malaria the editor emphasizes that malaria is still in many respects the most important single infectious disease of man, and that it is frequently rated as the number one medical problem in the present war.

Professor Huff in writing on Insects, Disease and Modern Transportation shows the diseases transmitted by insects and how long the insects live in aeroplanes. He warns of the problems that will confront us when we enter the age of the "flivver" plane. Professor Brunschwig in writing on Shock and Blood Substitutes; Professor Ricketts on Aviation Medicine and Professor Walker on the Neurological and Psychological Effects of Cerebral Injuries emphasize some of the unsolved problems in these subjects and explain their use in preserving the human resources used in war. Professor Slight writing on Psychiatry and the War reminds us that a large section of the public has not yet freed itself from irrational prejudice and bias toward mental disorders and reminds us that the same thing occurred in tuberculosis and venereal diseases. Among other facts he recalls that recent information indicates that approximately 30 per cent of casualties in battle zones are psychiatric in nature, but he says that with early treatment it is expected that 70 to 80 per cent of these men can be returned to duty. Professor McLean writes on Chemical Warfare. He ends his article with the sentence: "If, however, we remember the facts rather than the popular fictions about chemical warfare, of this one thing we can be very sure: The argument that either side avoids its use because of purely humanitarian reasons can, and should be dismissed in view of the weapons and methods actually being used by all belligerents."

This booklet is one which the medical profession can highly recommend to laymen to read the timely highlights on the increasing importance of medicine in modern warfare.



**FUNDAMENTAL EXERCISES FOR PHYSICAL FITNESS.** By *Claire Colestock*, A.B., M.A., Assistant Director Physical Education, City Schools, Pasadena, and *Charles Leroy Lowman*, M.D., F.A.C.S., Chief of Staff, Orthopaedic Hospital, Los Angeles. This is a Supplement to and Includes Selections from *Corrective Physical Education for Groups* by Lowman, Colestock and Cooper. Paper. Price, 50 cents. Pp. 314, with 72 illustrations. New York: A. S. Barnes & Company, 1943.

When the government turned over the physical fitness program in the Army and Navy to superannuated professional athletes, it challenged the American Physical Education profession. When the so-called commando tactics began to invade our high schools and junior high schools, our present standards of physical education were challenged. To meet these challenges, Dr. Charles L. Lowman, well-known orthopedic authority and Miss Claire Colestock, prominent member of the Physical Education profession, have given us a very timely book.

The book consists of two parts. The first seven chapters deal with statements of needs by various civilian and military leaders in physical education, planning and application of exercises, the screening methods, fundamental exercises for groups of growing boys and girls, harmful effect of unintelligent applications of exercises, analysis of exercises in common use and relaxation and relaxation technic. Part two covers methods and schedules of exercises for individuals and groups and restricted and corrective physical education in high schools. The text is well written and covers 314 pages. Many good illustrations demonstrate positions and exercises.

The importance of rest, exercises and relaxation is well described; the exercises are explained in detail. This is a book that should be obligatory reading for everyone interested in physical fitness. As physical fitness increases in importance during war, this book should be read by everybody.

**OSLER'S PRINCIPLES AND PRACTICE OF MEDICINE.** By *Henry A. Christian*, A.M., M.D., LL.D., (Hon.) Sc.D., Hon. F. R. C. P. (Can.) F. A. C. P. Hersey Professor of the Theory and Practice of Physic, emeritus, Harvard University; Clinical Professor of Medicine, Tufts College Medical School; Physician-in-Chief, emeritus, Peter Bent Brigham Hospital; Visiting Physician, Beth Israel Hospital, Boston Fifteenth edition. Cloth. Pp. 1498. Price, \$9.50. New York: D. Appleton-Century Company, 1944.

After an interval of only eighteen months a new edition of this popular textbook of medicine appears in order to keep pace with the rapid advances in medicine. There has been extensive revision particularly in the chapters on infectious diseases such as coryza, influenza, measles, mumps, lymphogranuloma, coccidioidomycoses, malaria and other conditions constituting wartime medical problems. New sections on penicillin and on aviation medicine are also included. In part the text on gout, diabetes, liver disease and anemia has been rewritten, whereas the chapters on diseases of the heart, kidneys and ner-

vous system are largely unaltered. From the point of view of Physical Medicine the discussion on arthritis and allied conditions leaves much to be desired. Local measures advocated include counter-irritation by cautery, blisters, mustard liniment and iodine. Thermotherapy, hydrotherapy and electrotherapy are not described in enough detail to be of any value to the reader, and the directions as to massage and exercises are inadequate. Although the ill effects of hot baths are mentioned, no warnings of the dangers of cabinet hyperpyrexia "for hours at 105-106 F." are given. The use of physical therapy in fibrositis and neuritis is also poorly described and no reference is made to the recent literature on these subjects. On the whole, however, this comprises an up-to-date textbook of great value to medical students. Information is authoritative and written in a style which is uniform and easily read, thus adding to the book's high recommendation.

**FIRST-AID TRAINING: A STUDY AND PRACTICE BOOK.** By *Morris Fishbein*, M.D., Editor, *Hygeia*, the Health Magazine and *Leslie W. Irwin*, Ph.D., Director of Health and Physical Education, the Laboratory Schools, University of Chicago. Paper. Pp. 216, illustrations. Price, 80 cents. Chicago, Lyons & Carnahan, 1943.

This book is intended for secondary school use as a text in first-aid and also to teach prevention of everyday accidents. It is designed with several pages of objective type of questions at the end of each chapter and instructions for practice problems. A clear and simplified explanation of bodily functions serves as an introduction. The importance of shock and especially the first-aid procedures to prevent shock are emphasized, and the necessity of doing nothing to some patients. Chapters then follow on the care of wounds; the control of bleeding; asphyxia; internal poisoning; bandaging; injuries from heat and cold; injuries requiring special attention such as puncture wounds, bites and eye injuries; fractures, dislocations and sprains; everyday problems such as sunburn, bruises, poison ivy; first-aid for the unconscious; and emergency transportation. Comprehensive review tests are also included. This appears to be a well-planned, practical study book which should be of great value to first-aid instructors.

**BURMA SURGEON.** By *Gordon S. Seagrave*, Lieut. Col., M.C., U. S. Army Forces in China, Burma, India. Cloth. Pp. 295, with 23 illustrations. Price, \$3.00. New York: W. W. Norton & Company, Inc., 1943.

This is a humorous dramatic story of a medical missionary and army surgeon. The book is labeled "127th Thousand," which shows it is well up on the list of best sellers. It starts with a humorous story of the author's first thought of a medical missionary. "I was about five years old. A great hulking Irishman stamped up the steps to the huge verandah of the house my great-grandfather had built to live in when, after the

second Burmese War, the British took over all of Lower Burma. . . . He relates the stories told by this man and "Then he grasped the top of a heavy dining-room chair in his teeth and swung it up over his head. . . . Then he asked me for a glass of water to quench his thirst and drank it down—standing on his head." The author asked his mother who the big chap was and was told that he was a medical missionary. From then on the author was going to be a medical missionary. One story after another portrays his early education, his medical education and marriage. Even his medical work in Burma was started at home. "The operating room superintendent decided to clear out all the useless broken-down surgical instruments that could no longer be repaired. I happened in as she was having the orderly take away a waste basketful of these instruments. Since I knew my Burman mission and the extent of surgical instruments I would find there, I asked for, and was given, that waste basketful. With them all my surgical work was done for five years, in spite of the fact that they were broken and not mates." There is a chapter on "Waste Basket Surgery."

In the North Shan States long before the present war Dr. Seagrave started his medical mission. Then the world and the war came nearer; the Burma Road is built; the Chinese war calls on the doctor's resources and an aeroplane factory is built near his hospital.

The fact that he could recruit and educate from twelve races of people (each with their own language), nurses without a common language, who work, and work skillfully, is indeed heartening. Their process of teaching nurses is not unlike the one in this country—motivation may be different—but the public cooperation and acceptance is at great variance. Dr. Seagrave and his nurses exemplify religion in its purest personal form, not by the number of times they went to church, the amount of their financial contribution, or by the number of times they prayed, but by the service motive as it applied objectively to life problems, people in distress, the relief of suffering. Florence Nightingale was thus motivated and impelled. Unfortunately, in our more modern civilization, economics must be part of the process of the nursing profession, as it is in medicine.

When the United States came into the war Dr. Seagrave is commissioned a Major in the Medical Corps by General Stilwell. Through the days and nights of Japanese bombing, he performs emergency operations amid the flames of burning towns. When the order comes he joins the retreat and his description of the retreat is most vivid. "At last about thirty miles from Hsipaw, Bill saw a broken down Zayat, or monastery resthouse and we went in to sleep. The joists had given way at one side, and the floor was thirty degrees off horizontal and covered with refuse and various excreta, but it seemed like paradise. We fell asleep immediately."

The operations done on this retreat are marvelous. The author describes one: "Grindlay

had begun work on a Gurkha, who eight days before had been chopped through the jaw, face, and neck, his fingers cut off, and his arms dangling as the result of wounds that had severed the bones at the elbows. With those awful wounds, which he had received at the hands of the Burmese, the Gurkha had walked eight days, until he accidentally stumbled upon our little set-up."

This book is highly recommended as a stimulating story of adventure in peace and war. It is filled with humor and adventure.

---

AIDS TO THE INVESTIGATION OF PERIPHERAL NERVE INJURIES. MEDICAL RESEARCH COUNCIL WAR MEMORANDUM No. 7. Second Edition. Paper. Price, 2s. Pp. 48, illustrated. London: His Majesty Stationery Office, 1943.

This atlas is intended to help those less experienced in the examination of patients with lesions of peripheral nerves. It was prepared by the staff of the Department of Surgery, University of Edinburgh. In this edition certain minor alterations of the text and captions have been made. The illustrations show the action of each muscle supplied by peripheral nerves because this committee emphasizes the extreme importance that examiners look for and try to feel the contraction of the muscle. They also point out that the examiner should apply the tests as they are illustrated, because the technic shown will eliminate many of the traps for the inexperienced provided by "trick" movements and the like. The usual nerve supply to each muscle is stated in the legends and the spinal segments from which it is derived. This atlas should be of great aid in the investigation of peripheral nerve injuries.

---

A GUIDE FOR THE BEDEVILLED. By Ben Hecht. Cloth. Pp. 276. Price, \$2.50. New York: Charles Scribner's Sons, 1944.

In true Hecht style, the author is pictured as talking about Jews to his hostess who says: "Jews are often a little skittish about the subject." Hecht replies: "You don't have to be too tactful, Jewishness is not a venereal disease." So Hecht launches into a most penetrating attack against anti-Semitism.

We have too much anti-Semitism in the medical profession. Should not our profession feel as Hecht says: "When a man's an anti-Semite, he is automatically a jackass, and who gives a damn about his Social Set? He has hung a smallpox sign on it, and it's he who has the pox, not I . . . . Who is lessened by this calamity? I have lost the companionship of a creature who has proved himself a fool. He has lost much more."

Many Jews are fearful of Jews becoming too prominent. "They argue that this happened in Germany and inspired the Germans to murder all the Jews—in order to 'win' back their country. This is nonsense of a most pathetic sort. The prominence of the Jews in Germany kept them safe for almost a century—and held off like a flashing sword the

German instinct for murder and brutality. Anti-Semitism has never thrived on the strength of the Jews, but on their weakness."

The reviewer is not a Jew so he can recommend that every physician should read this book. Ben Hecht combines this attack and analysis with lively humorous anecdotes and wit. He makes no apology for the Jewishness of Jews; but an appreciative explanation of their dynamic quality of life, and their individualism which makes them act, as he says, "like the yeast in the bread of civilization."

#### NERVOUSNESS, INDIGESTION, AND PAIN.

By *Walter C. Alvarez*, M.D., Professor of Medicine, University (Mayo Foundation) Rochester, Minnesota. Cloth. Pp. 488. Price, \$5.00. New York and London: Paul B. Hoeber, Inc., 1943.

In the opening sentence of the preface to his new book, *Nervousness, Indigestion, and Pain*, Dr. Alvarez states that this is a different sort of book. Naturally because of the title he has chosen, he couldn't be referring to the subject matter but only to his method of presentation, which is most aptly suited to a discussion of those anything but "different" morbid states that afflict so many members of the human race, with whose problems every medical man is confronted daily if he is in direct contact with people, no matter what their age, race, creed, nationality, or economic state.

It seems to me that Dr. Alvarez not only has chosen the best way to depict this group of patients whose ills are on the fringe of medical science, but also has been able to translate his large and long experience with human behavior into a most entertaining and instructive bit of writing.

It is apparent that Dr. Alvarez is one of those persons "constitutionally adequate" to sit and listen attentively and sympathetically to the nervous patient while he relates his almost inexhaustible variety of symptoms.

In some cases he readily perceives that treatment of certain persons with functional disease is just as hopeless from a therapeutic standpoint as treatment for a highly malignant tumor, and he points out the folly of physicians wasting their time attempting to remake such persons. This is especially valuable advice in the present emergency, but it is easier for the consultant than for the general practitioner not only to make such decisions but also to protect himself against the invasions of such patients.

In other cases he points out the relation of the patient's symptoms to the patient's "constitutional inadequacy" to carry the burdens that he has chosen to carry or that life has forced him to carry. Dr. Alvarez' anecdote type of therapy brings unusual results by helping the patient to understand how his symptoms result from functional disturbances, and especially by teaching him how to view and accept life, so that he can carry on with a more moderate burden and become a useful citizen in his community.

He goes to great lengths to show how to penetrate the smoke screen thrown up by some real but trivial disease and how to recognize that the patient's symptoms are not related to this disease and that

the treatment of this minor problem will only add another burden to the basic trouble—the frail constitution already loaded to the breaking point.

He cites numerous cases stressing the point that a clue obtained from a careful analysis of the patient's symptoms (history) caused him to pull a rabbit from the hat and make a brilliant diagnosis, which removed the patient from the neurotic class to which he had been condemned repeatedly, even by the City Consultant. Incidentally, Dr. Alvarez appears a little cynical at times, giving the impression that he is using the term City Consultant synonymously with City Slicker.

He not infrequently refers to "hunch" diagnoses. I could find no statement that he attributes "hunches" to some knowledge faintly registered on the cerebrum as experience, but he implies that he is trying to pass on his vast experience in dealing with the difficult patient and he does it very subtly in this manner.

He gives excellent dissertations on the management of many symptom complexes. In others, some of which are "daily problems," he gives the reader the impression that the brief discussion was filling material only. His bag of therapeutic tricks is well filled, but, as is to be expected, we look hopefully but in vain for an answer to some of our difficult problems. I was inclined to take exception to what appears to be a tendency to attribute too many symptom complexes to small cerebral thrombi and thus provide an easy "mental out." The chapter titles and subtitles are intriguing and in many cases tell a story in themselves. Those who do not meet in their own practices a large number of patients of the type described by Dr. Alvarez, so that experience is obtained at first hand, should avail themselves of this store of second-hand experience.

#### PIONEERS OF PEDIATRICS.

By *Abraham Levinson*, B.S., M.D., Assistant Professor of Pediatrics, Northwestern University Medical School; Cook County Graduate School of Medicine; Attending Pediatrician, Children's Division of the Cook County Hospital; Senior Attending Pediatrician, Sarah Morris Hospital for Children of the Michael Reese Hospital; Senior Attending Pediatrician, Mount Sinai Hospital, Chicago. Cloth. Price, \$2.00. Pp. 119. New York: Froben Press, 1943.

The second edition of Levinson's monograph, records many changes of historic importance since the publication of the first edition in 1936. It also demonstrates anew that pediatrics developed as part of the practice of medicine and thus most of the outstanding events in its progress also represent milestones in the progress of medicine. We find among the early pioneers of pediatrics the names of Hippocrates, Celsus, Gelen, Avicenna and among the later ones those of Sydenham, Glissen, Morgagni, Jenner, Oliver Wendell Holmes and Semmelweis. The study of the development of any branch of medicine proves again and again that medical knowledge is not the product of one age or even of one century. We can follow this in Levinson's painstaking recordings through the chapters on the Graeco-Roman period, the Islamic period, the Fif-



teenth Century, the Sixteenth Century, the Seventeenth and Eighteenth Centuries, and the Nineteenth and Twentieth Centuries. The last four chapters are devoted to *The Pioneers of Infant Feeding*, *Investigators of Alimentary Disturbances in Infancy*, *Pioneers in the Study of the History of Pediatrics* and *American Pioneers of Pediatrics*. There are 29 illustrations and reproductions in this stimulating monograph.

---

**ORGANIZING TO HELP THE HANDICAPPED.** By *T. Arthur Turner*. Cloth. Price, \$1.00. Paper, \$0.50. Elyria, Ohio: National Society for Crippled Children, Inc., 1943.

This book presents a brief guide for voluntary associations for the crippled. It describes the Federal-State programs for crippled children and the Federal-State programs of physical and vocational rehabilitation. It discusses the care of the handicapped as a social principle, the public programs for the education of handicapped children, relationship of public and private agencies for the handicapped and the general service of the voluntary groups. Among the special projects, the author devotes a chapter each to: (1) Summer Camps, (2) The Sheltered and Homebound, (3) Employment of the Handicapped, and (4) Community Health and Prevention of Handicaps. This monograph can be recommended to lay and professional workers in the fields of the handicapped.

---

**TEXTBOOK OF PHYSIOLOGY.** By *William D. Zoethout*, Ph.D., Professor of Physiology in the Chicago College of Dental Surgery (Loyola University), and *W. W. Tuttle*, Ph.D., Professor of Physiology, College of Medicine, State University of Iowa. Eighth edition. Cloth. Price, \$4.75. Pp. 728, with 308 illustrations and 3 color plates. St. Louis: C. V. Mosby Company, 1943.

This textbook is written for the use of students taking elementary and less extensive courses than those required in medical schools. In this new eighth edition the first chapter on protoplasm has been rewritten and serves as an excellent introduction for the study of the bodily functions. The style of writing is well adapted to the class of students for which the book is intended. Explanations are simplified as much as possible and clear. The illustrations are adequate and chosen from standard sources. The chapters on the circulation and on nerve and muscle physiology which are particularly important for physical

therapy students, are especially good. A glossary of terms is appended and is a valuable addition. The references are few, well-selected and up-to-date. In a book of this type chapter summaries could have been included to advantage. For physical therapy technicians, student nurses and others in similar courses, this book is recommended as a satisfactory text on physiology.

---

**MEMOIR OF WALTER REED. THE YELLOW FEVER EPISODE.** By *Albert E. Truby*, Brigadier General, United States Army, Retired. Cloth. Price, \$3.50. Pp. 238, with 27 illustrations. New York and London: Paul B. Hoeber, Inc., Medical Book Department of Harper and Brothers, 1943.

This new memoir of Walter Reed offers absorbing historical and medical interest at the present time, as the United States comes to the fore as a world power and as a center of advanced medical research. Written by a medical officer who has been closely associated with Walter Reed, it relates some of the history of the Cuban occupation, the first American experiment in colonial administration, and describes in full detail the fascinating story, how Walter Reed and his heroic co-workers by degrees accumulated the scientific evidence that yellow fever was transmitted by a mosquito. This is the story which has intrigued popular imagination for many years, and which because of its dramatic interest became a tempting subject for inaccuracies and misinterpretations. Truby depicts the sanitary conditions at Havana at the time of the American occupation, the outbreak of yellow fever and other infections in the Army encampments, the unsuccessful struggle of the Havana physician, Carlos Finlay, to gain recognition of his original theory of the mosquito-transmission of yellow fever, the organization of the world-famed "Yellow Fever Board" by the American Army, headed by Walter Reed, and finally the brilliant clarity of Reed's carefully controlled experiments on human subjects leading to the final conquest of the dreaded scourge. Truby's own data and illustrations are reinforced by the recent researches of Dr. Philip S. Hench of the Mayo Clinic, and by some material from the earlier book of Dr. Howard A. Kelly and some data from the American Medical Association on General Sternberg. Twenty-seven illustrations and a colored frontispiece-reproduction of Dean Cornwall's historic painting: *Conquerors of Yellow Fever*—add to the vividness of presentation. "Memoir of Walter Reed" is an authentic, well documented and well written story, worthy to be added to the library of any American physician.



## PHYSICAL THERAPY ABSTRACTS

### **The Effects of Stretching Nerves After Suture.**

**W. B. Highet, and F. K. Sanders.**

*Brit. J. Surg.* 30:369 (April) 1943.

In the surgical treatment of extensive lesions of the peripheral nerves the standard procedure is to resect the damaged segment of nerve until satisfactory proximal and distal cross-sections are obtained. In order to perform nerve suture the gap left after resection is closed by a combination of manipulative procedures (Stiles and Forrester-Brown, 1922), of which the most important is the shortening of the course of the nerve by flexion of one or more of the joints over which it passes. Following nerve suture the nerve is elongated by gradual extension of the flexed joints.

Gaps in the external popliteal nerve of the dog following extensive resection of the nerve in the thigh were closed by flexion of the knee and suture of the stumps with the limb in this position. After keeping the knee in flexion for fourteen days by means of a plaster coat, the nerve was stretched by extending the knee, either (a) gradually by means of a turnbuckle plaster, extension being completed in fourteen days, or (b) rapidly, through the animal's own movements. The site and extent of stretching was determined by means of a line of silver clips placed along the nerve at operation, and photographed by x-rays before and after stretching was brought about.

In the normal animal some elongation of the nerve over its whole length from the sciatic plexus to its entry into the shank musculature accompanies extension of the knee. By far the greatest part of the increase in length of the course of the nerve during knee extension in the normal animal, is made up by the straightening out of the tortuosity of the nerve.

When gaps have been closed by flexion of the knee, the extra distance is made up by elongation of the nerve. Straightening out of tortuosity plays only a minor part.

The elongation produced in this way was not distributed uniformly along the length of the nerve in the thigh. Scar tissue formed around the suture line bound the nerve to its bed, so giving a secondary fixed point, and disproportionate elongation of the peripheral stump occurred. The most distal segment of the peripheral stump stretched to the limit of its extensibility when the suture was made low in the thigh.

After such stretching the nerve returned to its original length with each subsequent flexion of the knee. Permanent elongation of the stretched segment of the nerve does not, therefore, take place during the first thirty-five days after operation.

Elongation of nerves by amounts of the order investigated produces histologic damage of the following kinds: (a) extensive, abnormal degeneration in the central stump; (b) where the suture line is not bound down by scar tissue, separation of the stumps can take place; (c) rupture of Schwann tubes in the regions where stretching is most severe; (d) extensive oedema and fibrosis both without and within nerve bundles, causing considerable disruption of the pattern of the nerve. All these factors will tend to reduce the chances of a recovery of good quality.

Rapid nerve stretching did not cause any more damage than slow stretching, except, perhaps, in so far as separation at the suture line occurred more frequently.

The bearing of these results on the post-operative stretching of human nerves is discussed.

### **The Measurement of Non-Ionizing Radiations for Medical Purposes.** W. V. Mayneord, and T. J. Tulley.

*Proc. Roy. Soc. Med.* 36:422 (June) 1943.

During the course of recent work on the energy absorbed by a patient undergoing treatment in a beam of X or gamma rays interest was aroused in the corresponding problem for other types of radiation. A search of the clinical literature revealed how rarely any measurement of radiation is recorded for infra-red, visible or ultra-violet light, and preliminary experiments were therefore made to obtain data in absolute energy units.

No apology is needed for insistence on the importance of measurement of radiation. The correlation of data obtained by different workers, the safety of the patients and the avoidance of accidental over or under exposure, the study of the physiologic effects of the same quantity of energy at different parts of the wavelength scale, the interpretation of clinical and biological results, all demand precise quantitative data. Moreover, the change which comes over the aspect of a subject as it becomes quantitative is profound and progressive. The making of measurements not only supplies valuable information but leads to a change of outlook which in time profoundly affects the whole subject.

The discovery of infra-red radiation was made by Sir William Herschel in 1800 by inserting thermometers of "exquisite sensibility" in different parts of the solar spectrum and the method of choice of measurement of infra-red is still to observe the small rise of temperature of an absorber when exposed to the beam. The absorber should seize all energy falling on it, showing no selective absorptions or reflections and so be



independent of the wavelength of the incident radiation.

Used in the measurements was either a Cambridge Moll type microthermopile or General Electric vacuum thermocouples with appropriate electrical instruments.

The paper contains an account of theoretical and experimental work on the measurement of non-ionizing radiations, particularly infra-red and visible light. Reasons are given for suggesting that the incident intensity of radiation in therapeutic practice should be measured in Gm. cal./cm.<sup>2</sup> min. From such data energy absorption in the patient may be approximately deduced. The absorption in celluloid of radiation from sources of different color temperatures may form the basis of a "quality" measurement of infra-red.

The standards of radiation measurement employed are a Moll microthermopile with a fluoride window, calibrated by the National Physical Laboratory, and a 40 watt carbon filament lamp. Small vacuum thermocouples have been used in the construction of a clinical instrument whose characteristics were carefully studied.

Measurements on patients show that the intensities of radiation employed in practice are frequently of the order of 2 Gm. cal./cm.<sup>2</sup> min. The threshold for pain appears to be 3 to 4 Gm. cal./cm.<sup>2</sup> min. The distribution of radiation over a plane perpendicular to the axis of the beam has been studied as well as that over the surface of patients being treated in radiant heat cradles. A study was also made of the variation of intensity with distance from a lamp in a reflector.

#### **Rapid Acclimatization to Work in Hot Climates.** Sid Robinson; E. S. Turrell; H. S. Belding, and S. M. Horvath.

Am. J. Physiol. 140:176 (Nov. 1) 1943.

The problem of man's acclimatization to heat has claimed the attention of numerous physiologists. There seems to be general agreement about some of the changes that take place, although the extent of these changes and the reasons for them are less certain. Almost all observers agree that working men in hot climates have higher blood volumes and interstitial fluid volumes than the same men in cold climates.

During the winter, experiments were carried out in which men walked on a motor driven treadmill from one to one and one-half hours a day in a room where desert conditions were simulated. When the men first began to take the walks the work was severe enough and sufficiently long to bring on symptoms of heat exhaustion.

The comfort and ease with which the men repeated the same walks which originally exhausted them increased rapidly during about seven days and thereafter more slowly up to twenty-three days.

The heart rates of the men during the latter part of the walks declined from an average of 178 in the beginning to 155 on the seventh day.

The average skin temperature and rectal tem-

perature of the men at the end of the work experiments declined from 98.4 to 96.5 F. and from 103.4 to 101.7 F., respectively during the same period.

This rapid improvement in temperature regulation during the first seven days amounted to about 80 per cent of the entire improvement in twenty-three days. It was accompanied by an increase in the rate of sweating in one man and decreases in metabolic rate during work in the others. The slow improvement in temperature regulation occurring after the seventh day was not accompanied by continued lowering of metabolic rate nor by increase of sweating during the experiments. However, the capacity for sweating in harder work than the standard experiments did increase.

#### **Section of Orthopaedics. B. H. Burns.**

Proc. Roy. Soc. Med. 36:214 (March) 1943.

Patients with acute myofascial lesions are given a period of rest in bed, during which they are given an injection of novocain into the tender spot, repeated in three to four days' time. Heat and massage are also given. As soon as the acute symptoms have subsided the patients are put on graduated physical treatment and when fit they have a period of full gymnastic exercise before returning to their units, or (if they are civilians) to work.

Patients with chronic myofascial lesions are treated in a similar manner, without the rest in bed. Manipulation is carried out under anesthesia only in those patients who after an initial improvement fail to make further progress.

Patients with perineuritis are treated in the same general way as the myofascial group, except that in place of local injection they are given epidural injections of 100 cc. 1 per cent novocain. Manipulation under anesthesia to increase the straight leg raise is only carried out if there is no spontaneous pain (that is no pain at rest) but only on movement. Patients with spontaneous pain have an active inflammatory lesion which will be aggravated by manipulation, but those with limited straight leg raise and pain on movement only are suffering from the results of past inflammation, possibly adhesions, which can be broken down by manipulation.

Patients with neuritis are treated with rest in a plaster bed and epidural injections.

#### **The Significance of Vascular Hyperreaction as Measured by the Cold-Pressor Test. Henry I. Russek.**

Am. Heart J. 26:404 (Sept.) 1943.

According to Hines and Brown, essential hypertension is a syndrome which develops on the soil of hyperreactive vasomotor system. Subjects with vascular hypertonicity and normal blood pressure are regarded by the authors as candidates for the disease.

The procedure as outlined by Hines and Brown was followed throughout. The subject remained

recumbent in a quiet room and blood pressure readings were taken over variable periods until a basal level was reached. The rest period was twenty to thirty minutes, and, usually, four to five readings were made. The sphygmomanometer cuff remained on the arm during the whole procedure, and, when the lowest level of blood pressure was reached, the free hand was placed in a basin of water at a temperature of 4 C. The hand was kept immersed to a level just above the wrist for sixty seconds. The blood pressure was measured at thirty and sixty seconds.

The response is recorded as the difference between the basal level and the maximum reading. Using the authors' criteria, subjects whose response exceeded 20 mm., systolic, and 15 mm., diastolic, were called hyperreactors. Those whose response did not exceed these figures were designated as hyporeactors.

There is no support for the view that the cold-pressor response is characteristic for the individual throughout life.

The combined incidence of hyper-response and hypertension in the subjects 60 to 69 years of age was almost three times the incidence of hyper-response in the school children observed by Hires. The fact that elderly hyperreactors may actually be latent hypertensives would not influence this comparison.

There was no relation between hyper-response and a positive family history of hypertensive cardiovascular disease.

The high incidence of hyper-response in normal subjects over the age of 50 renders the test unreliable in the diagnosis of latent hypertension, associated with congestive failure, in this group.

Hyper-response among normal subjects in the later decades of life is unrelated to essential hypertension.

#### Physics and the Surgeon. H. S. Souttar.

Brit. M. J. 4327:740 (Dec. 11) 1943.

It has been customary to choose as a subject for the Bradshaw Lecture some aspect of surgery which has interested the speaker for much of his life, which is of general interest to his colleagues in the art of surgery and which is not without interest to the layman. The author presented the subject of force, heat, and radiation as branches of physics which affect the surgeon most closely and which he is constantly turning to his own use. He limited himself to a few problems with which he met with in surgical work and on which some knowledge of physical principles has thrown light, sometimes revealing important features that would otherwise have been missed.

There are many points at which the work of the surgeon enters the field of physics and for the solution of many of the problems of surgery the physicist could give invaluable help. The author hopes that the future may see a fuller collaboration between two branches of science which at first seem to have little in common and that each may gain from the experience which the other brings.

#### Electric Shock Therapy (A Preliminary Report). Stewart T. Ginsburg, and Harry H. Botts.

M. Bull. Vet. Admin. 20:246 (Jan.) 1944.

The authors report that to 43 patients they gave a total of 1,090 applications, causing 248 petit mal and 705 grand mal convulsions without a single complication.

Reporting on 26 patients in whom treatment was completed, 20 were suffering from dementia praecox of the simple type in 1, the hebephrenic in 7, the paranoid in 3 and the catatonic type in 9. The remaining 6 patients in the treatment-completed series had a manic depressive psychosis, 4 of the depressed and 2 of the manic type.

In their summary the authors conclude that electric shock therapy is proving its usefulness in the treatment of beneficiaries of the Veterans' Administration. It is easily administered and inexpensive. It gives very little discomfort, and the patients require very little aftercare. The amnesia produced by the treatment results in lessened fear and antagonism to treatment. A large number of patients can be treated with a minimum of time and personnel. The danger of complications can be minimized by the careful selection of patients, and by using all possible precautions during the course of treatment. When used as an adjunct with the other forms of therapy at one's disposal it gives gratifying results.

#### Vitamins and Physical Performance. Austin F. Henschel.

J. Lancet 63:357 (Nov.) 1943.

War by its demands for increased physical output and its restrictions on availability and choice of foods has made mandatory a critical analysis of the factors that influence the work and capacity of man. The general problem of the relation of diet to physical performance has recently been reviewed.

In the present discussion emphasis is placed on vitamin A, the B complex vitamins (particularly thiamine, riboflavin and niacin) and ascorbic acid. The purely clinical manifestations of vitamin deficiencies are included only as they bear on the specific problem of physical ability.

All acceptable evidence agrees that the addition to an "adequate" diet of any or all of the vitamins known to be required by humans does not increase physical performance, work output or recovery from fatiguing work.

Hard physical work can be performed without physical deterioration for months on diets that contain about one-half the recommended daily intake of B complex vitamins. Hard physical work apparently does not greatly increase B complex vitamin requirements beyond those due to the increased caloric output.

In the normal young man 0.30 mg. of thiamine per 1,000 calories is sufficient for at least some months to prevent deficiency symptoms and to allow maximum physical performance. Larger thiamine intakes have no effect on work capacity.

The riboflavin requirement for maximum physi-

cal efficiency is probably not appreciable more than 1 mg. daily.

Available information does not allow a precise estimation of the niacin requirements for maximum physical performance. However, 15 to 20 mgs. per day will probably prove sufficient.

Daily intakes of 25 mgs. of ascorbic acid over long periods of time have not been accompanied by signs of scurvy or by physical deterioration.

Claims about the possible reduction in work output by the current vitamin levels in the American diet are not justified from the present state of knowledge.

#### **The Effect of Temperature of the Blood on the Heart Rate. Ernest K. Landsteiner, and Morris Hayes.**

*Am. J. Physiol.* 140:258 (Nov.) 1943.

The effect of variations in the temperature of the blood flowing through the heart in the heart-lung preparation was studied in the dog by Knowlton and Starling in 1912.

The paucity of data concerning the effect of temperature of the blood on the heart rate of the intact animal led the authors to investigate this problem further. Records were made, therefore, of the alterations in the heart rate produced by injection into the external jugular vein of the intact animal of fluid, the temperature of which was varied from 22.0 C. to 57.0 C.

The results of these experiments may be listed:

1. Infusions of saline solution at "body" temperature produced no change in the heart rate.
2. Infusions of saline solution at a temperature below that of the body produced a bradycardia in all experiments. This, depending on the temperature of the infusion, varied from 20 to 100 beats.
3. Infusions of saline solution at a temperature above that of the body caused a tachycardia of from 10 to 90 beats.
4. These effects occurred equally well both before and after bilateral cervical vagotomy.
5. A number of infusions of cool saline (30 C.-35 C.) given into the femoral vein and into the pulmonary artery produced no alteration in the heart rate.
6. In each case the change of pulse rate began 2 to 3 seconds after the beginning of the infusion and lasted for several seconds after all the fluid had been injected. No consistent or important changes in general blood pressure were caused by the infusions. The venous pressure always rose moderately during the administration of the fluid.

The generalization may be made that within the limits of the temperatures employed in these studies the lower the temperature of the saline solution the greater the degree of bradycardia, and the higher the temperature the greater the degree of the tachycardia.

The fact that this effect occurs after vagotomy and (as has been shown by Kisch with heat) after sympathectomy indicates probably that local

conditions—possibly direct action on the Keith Flack node—are of importance.

The absence of alterations in the pulse rate when saline solution was introduced into the femoral vein and pulmonary artery suggests that in these instances mixing and warming of the fluid injected take place in its transit to the right heart.

#### **The Anatomical Basis of Physical Medicine With Special Reference to the Peripheral Nervous System. H. A. Harris.**

*Proc. Roy. Soc. Med.* 36:308 (April) 1943.

Physical medicine must face the task of restoring and maintaining in the injured both self-respect and earning capacity by keeping in view the three prime necessities of fresh food, fresh air and adequate exercise of all the systems of the body.

The study of physical medicine requires some acquaintance with the history and the development of the knowledge of the nervous and locomotor systems. This survey exemplifies a few of the points relating to the anatomy of the peripheral nervous system. It is as yet impossible to state the part played by nature and that played by physical medicine in healing injury and disease of the nervous system.

A description of some of the historic aspects of the present knowledge of the peripheral nervous system with special reference to the significance of the segmental nerve, the innervation of the skin of the limbs, the morphology of the brachial and lumbo-sacral plexus and the clinical importance of the ventral and dorsal axial lines.

The segmental innervation of the muscles of the limb is discussed, in particular muscles with a double nerve supply and the intrinsic muscles of the fingers and thumb.

The 6th cranial, 1st thoracic and 4th lumbar nerves are peculiarly susceptible to hazards.

#### **Blind Physical Therapists.**

*Brit. M. J.* 4327:755 (Dec. 11) 1943.

The school of massage for blind men and women, established by the National Institute for the Blind in 1915, is to be enlarged. As the only training center in the world exclusively for sightless physical therapists, the Institute has regarded it a point of honor to maintain a high degree of efficiency, a policy that has established the blind masseur as second to none in the profession. One reason for enlarging the school is the proved success of the "educated" blind and the increase in this category brought about by the growing number of young people passing through the National Institute's two public schools, Worcester College for blind boys and Chorleywood College for Girls with little or no sight. Worcester was much enlarged shortly before the outbreak of war, but already it is filled to capacity; Chorleywood also is nearing the point where more accommodation will be needed for myopic girls eligible for secondary



education. Beyond these sources of potential students for the massage school, account must be taken of blinded war casualties in the fighting Services and civilian population, among whom are bound to be many persons desirous of, and suitable for, training. A matter to which full attention must be given is the demand of the profession itself. The blind practitioner cannot lag behind the advancing technic and the curriculum at the school must be adjusted accordingly. The present two-year course puts severe pressure on the students and a longer course will probably have to be introduced soon. It is to meet the challenge of modern developments and to help more young blind persons of ability that the National Institute has decided to embark on the extension scheme.

#### **Economic Aspects of Health Resort Therapy. A. M. Simons.**

J. A. M. A. 124:33 (Jan. 1) 1944.

The Principles of Ethics of the American Medical Association recognizes the distinction drawn. The sentence which declares that "solicitation of patients by physicians as individuals, or collectively in groups by whatsoever name these be called, or by institutions or organizations, whether by circulars or advertisements, or by personal communications is unprofessional," is immediately followed by the statement, "This does not prohibit ethical institutions from a legitimate advertisement of location, physical surroundings and special class—if any—of patients accommodated."

The financial uncertainty is aggravated by the seasonal character of most spas. Many are open for less than half the year and nearly all show pronounced peaks and depressions in a chart of their annual patronage. This, in part, is due to the combination of recreational and medical features. Patronage of the recreational features is naturally higher during the "vacation" months of the year. Many spas owe much of their attraction to climatic conditions which are dependent on the seasons. Treatment of chronic disease is often "optional" and will be postponed to the most convenient and pleasant time.

All of these conditions being subject to wide fluctuations, it is not surprising that their combined effect renders spa operation financially hazardous.

Since the business phases of spa management are so closely intertwined with the practice of medicine, it is certain that any such code formed by an association of spas will need to be brought into harmony with the principles of ethics of the medical profession.

#### **Pressure Palsy in the Paralyzed Limb. Walpole Lewin.**

Lancet 25:758 (Dec. 18) 1943.

For a long time surgeons have known that the lateral popliteal nerve is vulnerable as it winds

around the neck of the fibula to gain the anterior aspect of the leg and that it may be damaged by local pressure even when this is maintained for relatively short periods.

Attention has been drawn to the relative commonness in paralyzed limbs of lateral popliteal palsies, due to pressure.

Clinically it is often impossible to differentiate these palsies, but electromyography and the sweating test clearly demonstrate them. It is stressed that all who have the nursing care of such patients, particularly in their transport, should be fully aware of the condition and prevent it by adopting simple prophylactic measures.

In many of these cases, where progress is often to be measured by so little, care must be taken that in their treatment unwittingly the disability is not increased.

#### **March Fracture of the Metatarsals. W. Sayle Creer.**

Correspondence Brit. M. J. 4328:793 (Dec. 18) 1943.

All who have fresh evidence about obscure conditions should publish the facts. It is more important that what is written should be strictly accurate as to facts and up-to-date as to information and views published by others. In both respects Fl. Lieut. Barns' article on march fracture of the metatarsals leaves much to be desired. This letter is intended to correct some mistakes and misconceptions which appear to have arisen.

In short, people suffer from march fractures because the structure, the architecture, of their feet is wrong, and not because of any unusual external factor. The only part that external factors play is the same as applies to any mechanical structure. A bridge designed to carry 5 tons is more likely to give way when 10 tons go over it than one strong enough to support 10 tons.

The author has made his letter long and strong because he feels we have reached a stage in the knowledge of the behavior of the foot when we can no longer be content to impede the diffusion of knowledge by accepting without protest articles which ignore facts accumulated by other workers.

#### **Device for Making Hot Packs. D. C. Conzett.**

Bull. U. S. Army Med. Dept. 70:87 (Nov.) 1943.

The possibility of admitting patients with acute poliomyelitis focused attention on making plans for the treatment of such patients. Personnel trained in the Kenny method of treatment were available, but facilities for the preparation of the hot packs were not at hand. The technician provided these facilities by using only government-issue material which was already available on the post. This apparatus was so effective that it was immediately put into service in the septic surgery ward. With this aid, hot packs are made easily available for the entire ward.



**Neuromuscular Disorders in Poliomyelitis. J. Moldaver.**

J. Bone & Joint Surg. 26:103 (Jan.) 1944.

Moldaver carried out a series of investigations to test the Kenny concept of poliomyelitis. Neuromuscular degeneration, such as would be caused by lesions of the anterior horn cells, was explored by the chronaxia method; the so-called spasm was studied in some patients, mostly by electromyograms. Fifty-one patients were tested. The time elapsed between the onset of the disease and the tests varied from ten days to one year. Muscles called "alienated" as well as muscles in "spasm" were explored; muscles considered to be normal clinically also were tested. It was always found that the more advanced the degeneration, the less extensive was the "spasm." The author emphasizes that "spasm" is not the most damaging symptom of the disease; it is a complex and ill defined phenomenon under which several different conditions are included. "Spasm" does not lead to neuromuscular degeneration. In paralytic and paretic muscles called "alienated" there was always some degree of neuromuscular degeneration. Among these muscles some were partially denervated; these have a good chance to recover. Some others were totally denervated and therefore will not recover. There is no clinical evidence of "incoordination" in the ordinary sense. The patients attempt voluntarily or involuntarily to use a stronger muscle for a weak or paralyzed one. This abnormal use of an extremity is substitution and not "incoordination."

**Influence of Weather and Solar Activity on Fatal Pulmonary Embolism. R. and G. Reimann-Hunziker.**

Zentr. f. Chir. 69:1141 (July 11) 1942.

The Reimann-Hunzikers investigated the influence of weather and of solar activity on the mortality from embolism on the basis of 224 fatal pulmonary embolisms that were subjected to necropsy in Basel. Embolism occurs rarely on days of the passage of cold fronts. However, there is a high incidence of embolism on days with storm fronts and heat thunder storms. During winter there is a high frequency of embolism during occlusions. A foehn increases the mortality from embolism. During winter embolism is rare in the presence of continental air bodies, but in the presence of maritime and polar-maritime air bodies embolisms are frequent. During summer mortality from embolism increases during the passage of tropical maritime, tropical continental and polar maritime air. Change of an air body to maritime air increases the incidence of embolism during winter but not during summer. In winter embolism is rare in the presence of continental air. Investigating the influence of solar

activity, the authors found that on days with a high incidence of embolism the average magnetic disturbance of the ionosphere is greater than on other days. They also observed an indication of a possible relationship in periodicity between mortality from embolism and solar rotation. There was an increase in cases of eclampsia at times of increased mortality from embolism. It was also observed that, at the time of the culmination of foci of activity in the central meridian of the sun, embolisms increased. There was an increase in embolism mortality on the days following the new appearance of sun spots.

**Common Hyperkeratotic Lesions of the Foot. R. M. Montgomery, and A. H. Montgomery.**

J. A. M. A. 124:756 (March 18) 1944.

The various means of treating verruca are given. The best therapy usually depends on the type present and whether it is radioresistant or radiosensitive. Electrosurgery is an excellent means of removing all but the mosaic type. The lesion may be curetted and the base desiccated or coagulated. The disadvantages are the long period of disability due to ulceration and the possible postoperative painful scar.

**Management of the Venereal Diseases in the Army. Thomas B. Turner, and Thomas H. Sternberg.**

J. A. M. A. 124:133 (Jan. 15) 1944.

The one day method of Simpson, Kendell and Rose, in which arsenoxide and fever therapy are combined, has the further disadvantage of being technically more difficult and no less risky than the five day intravenous drip.

It is estimated that fully 50 per cent of the total days lost from duty because of gonorrhea are accounted for by the 10 to 20 per cent of those patients who fail to respond to two courses of sulfathiazole or sulfadiazine and are classed as sulfonamide resistant.

Until the advent of penicillin, fever therapy—eight hours of continuous fever at a temperature of 106 F.—combined with sulfonamides by mouth was the only method by which resistant patients could be promptly cured. In order to reduce the manpower loss occasioned by these resistant patients, facilities for fever therapy are provided in general hospitals. However, this method of treatment is expensive in terms of personnel and equipment; it is not without risk to the patient and can be justified only on the basis of military necessity. It is hoped that enough penicillin will soon be available to treat all of these patients and render it unnecessary to use fever therapy.

# American Congress of Physical Therapy

## Officers and Committees 1944

### Officers

#### President

*Kristian G. Hansson, M.D.*  
New York

#### President-Elect

*Miland E. Knapp, M.D.*  
Minneapolis

#### First Vice-President

*Walter S. McClellan, M.D.*  
Saratoga Springs, N. Y.

#### Second Vice-President

\* *H. Worley Kendell, M.D.*  
Chicago

#### Third Vice-President

\* *Kenneth Phillips, M.D.*  
Miami, Fla.

#### Fourth Vice-President

\* *O. Leonard Huddleston, M.D.*  
Denver, Colo.

#### Fifth Vice-President

*Earl C. Elkins, M.D.*  
Rochester, Minnesota

#### Secretary

*Richard Kovács, M.D.*  
New York

#### Treasurer

*John S. Coulter, M.D.*  
Chicago

#### Executive Director

*Walter J. Zeiter, M.D.*  
Cleveland

#### Executive Secretary

*Marion G. Smith, B.Sc.*  
Chicago

### Advances in Education

*Earl C. Elkins, M.D., Chairman.*  
*Frances Baker, M.D.*  
*Robert L. Bennett, M.D.*  
*William Bierman, M.D.*  
*Catherine West, M.D.*

### Constitution and By-Laws

*John S. Coulter, M.D., Chairman.*  
*Frank H. Ewerhardt, M.D.*  
*William D. Paul, M.D.*

### Cooperation With Army, Navy, Public Health and Veterans Administration

*Frank H. Krusen, M.D., Chairman.*  
\* *Everill Wm. Fowlks, M.D.*  
\* *O. Leonard Huddleston, M.D.*  
\* *H. Worley Kendell, M.D.*  
\* *Louis B. Newman, M.D.*

\* In active service.

### Finance

*Frank H. Krusen, M.D., Chairman.*  
*Frank H. Ewerhardt, M.D.*  
*Roy W. Fouts, M.D.*

### Legislation

*Milton G. Schmitt, M.D., Chairman.*  
*William Northway, M.D.*  
*Jessie Wright, M.D.*

### Medical Economics

*Madge C. L. McGuinness, M.D., Chairman.*  
*William D. Paul, M.D.*  
*B. S. Troedsson, M.D.*

### Meeting Place

*Walter J. Zeiter, M.D., Chairman.*  
*Richard Kovács, M.D.*  
*Isadore Levin, M.D.*  
*Albert A. Martucci, M.D.*  
*Robert L. Stecher, M.D.*

### Membership

*Richard Kovács, M.D., Chairman.*  
*John S. Hibben, M.D.*  
*Emil J. C. Hildenbrand, M.D.*  
\* *O. Leonard Huddleston, M.D.*

### Military Problems

\* *Major O. L. Huddleston, (MC), Chairman.*  
\* *Lt. Comm. Edward Lee Alexander, (MC), U. S. N. R.*  
\* *Major Ben Boynton, (MC).*  
\* *Lt. Comm. Rodney Chamberlain, (MC), U. S. N. R.*  
\* *Lt. Comm. R. E. Kinneman, (MC), U. S. N. R.*  
\* *Major Donald Rose, (MC).*  
\* *Lt. Col. Norman E. Titus, (MC).*  
\* *Lt. Comm. John F. Wyman, (MC), U. S. N. R.*

### Nominating

*Fred B. Moor, M.D., Chairman.*  
*William Bierman, M.D.*  
*Frank H. Krusen, M.D.*  
*Nathan H. Polmer, M.D.*  
*William H. Schmidt, M.D.*

### Problems Affecting Technicians

\* *O. Leonard Huddleston, M.D., Chairman.*  
*Nathan H. Polmer, M.D.*  
*Arthur L. Watkins, M.D.*

### Public Relations

*William H. Schmidt, M.D., Chairman.*  
\* *H. Worley Kendell, M.D.*  
*William B. Snow, M.D.*

### Scientific Exhibits and Gold Key Awards

\* *O. Leonard Huddleston, M.D., Chairman.*  
*Robert L. Bennett, M.D.*  
*John S. Coulter, M.D.*  
*Disraeli Kobak, M.D.*  
*Walter S. McClellan, M.D.*

# APPROVED SCHOOLS FOR PHYSICAL THERAPY TECHNICIANS Council on Medical Education and Hospitals of the American Medical Association \*

Name and Location of School	Medical Director	Technical Director	Emergency Course				Regular Course			
			Entrance Requirements <sup>1</sup>	Length in Months	Classes Start	Tuition	Degree, Certificate, Diploma	Length in Months	Classes Start	Tuition
Army and Navy General Hospital, Hot Springs National Park, Ark.	Walter J. Lee, Maj., MC	Agnes P. Snyder, 1st Lt., PTA	†	6	Jan/July	None	Certificate	12	Feb/Aug	\$200
Children's Hospital, Los Angeles	Samuel S. Mathews	Lily H. Graham	a-b-c	6	Feb/Aug	\$200	Certificate	12	Jan/July	\$215
College of Medical Evangelists, Los Angeles <sup>2</sup>	Fred B. Moor	A. H. Carlson	a-b-c	9	Quarterly	\$286	Certificate	12	Mar/Oct	\$150
University of California Hospital, San Francisco <sup>3</sup>	Frances Baker	Margery L. Wagner	a-b	7	Quarterly	\$286	Certificate	10	Quarterly	\$409
Stanford University, Stanford University, Calif. <sup>4</sup>	Wm. H. Northway	Catherine Worthingham	a-b-d <sup>5</sup>	7	Quarterly	\$286	Certificate	10	Quarterly	\$409
Fitzsimons General Hospital, Denver	Ora L. Huddleston, Maj., MC	Doris Anderson, Capt., PTA	†	6	Feb/Aug	None	Certificate	12	Feb/Aug	\$200
Walter Reed General Hospital, Washington, D. C.	Donald L. Rose, Maj., MC	Evlyn L. MacDon-ald, Capt., PTA	†	6	Quarterly	None	Certificate	12	Jan/July	\$200
Northwestern University Medical School, Chicago	John S. Coulter	Gertrude Beard	a-b-c	6	Mar/Sept	None	Certificate	9	July/Oct	\$200
State University of Iowa Medical School, Iowa City	W. D. Paul	Olive Farr	a-b-c <sup>6</sup>	6	June	\$250	Certificate	8-4 yrs.	Mar/Sept	\$400 yr.
Bouvé-Boston School of Physical Education, Boston	Arthur L. Watkins	Constance K. Greene	a-b-c	6	Mar/Sept	\$250	Certificate	9	Mar/Sept	\$300
Harvard Medical School, Boston	Frank R. Ober	Janet B. Merrill	a-b-c	6	Mar/Sept	\$250	Certificate	9	Mar/Sept	\$300
Boston University Sargent College of Physical Education, Cambridge, Mass.	Louis Howard	Lucille W. Fuller	a-b-c <sup>4</sup>	(Given in conjunction with Harvard)				19	Oct	\$435 yr.
University of Minnesota, Minneapolis <sup>7</sup>	Miland E. Knapp	Sara E. Kolman	a-b-c	6	Jan/July	None	Certificate	12	Mar	\$168 <sup>8</sup>
Mayo Clinic, Rochester, Minn. <sup>9</sup>	Frank H. Krusin	Carl O. Moe Schulz	a-b-c	6	Jan/July	None	Certificate	9	Jan/July	None
Barnes Hospital, St. Louis	F. H. Ewerhardt	Beatrice F. M. Schulz	a-b-c	6	Jan/Sept	\$250	Certificate	4 yrs.	Oct	\$200
St. Louis University School of Nursing, St. Louis <sup>10</sup>	Alex. H. McKis	St. M. M. Schulz	a-b-c <sup>3</sup>	8	Jan/Sept	\$250	Certificate	4 yrs.	Jan/Sept	\$250 yr.
O'Reilly General Hospital, Springfield, Mo.	John H. McKis	Ed. M. Thelmann, Capt., PTA	†	6	Jan/July	None	Certificate	10	Feb/Sept	\$300
Columbia University, New York City	Wm. B. Snow	Josephine Rathbone	a-b-c	6	Jan	\$200	Diploma	9	Feb/Sept	\$300
Hospital for Special Surgery, New York City <sup>11</sup>	K. G. Hanson	Ebel M. Willmer	a-b-c	6	Jan	\$200	Diploma	9	Feb/Sept	\$300
New York University School of Education, New York City <sup>12</sup>	Geo. G. Deaver	Paula Blackman	a-b-c	6	Jan	\$200	Diploma	9	Feb/Sept	\$300
Duke Hospital, Durham, N. C. <sup>13</sup>	Lenox Baker	Helen Kaiser	a-b-c	6	Jan	\$200	Diploma	9	Feb/Sept	\$300
Cleveland Clinic Foundation Hospital, Cleveland	Walter J. Zeiler	Anna Wetterhuus	a-b-c	6	Jan	\$200	Diploma	9	Feb/Sept	\$300
D. T. Watson School of Physiotherapy, Leedsdale, Pa. <sup>14</sup>	Tessie Wright	Kathryn Kelley	a-b-c	6	Apr/Oct	\$200	Diploma	12	Oct	None
Graduate Hosp. of the Univ. of Penn., Philadelphia <sup>15</sup>	G. W. T. Johnson	Samuel M. Henshaw	a-b-c	6	Apr/Oct	\$200	Diploma	12	Oct	\$200
University of Texas School of Medicine, Galveston	W. W. T. Eggers	Billie L. Crook	a-b-c	6	Apr/Oct	\$200	Diploma	12	Jan/Sept	\$200
Brooke General Hospital, San Antonio, Texas	A. O. Loiscelle, Maj., MC	Elsie Kuraner, Capt., PTA	a-b <sup>6</sup>	6	Jan/July/Oct	None	Certificate	9	Jan/July	\$130 <sup>8</sup>
Richmond Professional Institute, Richmond, Va.	T. F. Wheelodon	Erma Cannon	†	6	Jan/July/Oct	None	Certificate	9-12	Sept	\$200 <sup>8</sup>
University of Wisconsin Medical School, Madison <sup>16</sup>	F. A. Hellebrandt	Margaret A. Kohli	a-b <sup>7</sup>	6	Apr/Oct	\$72 <sup>8</sup>	Certificate	12	Apr/Oct	\$90 <sup>8</sup>

\* Courses are so arranged that any of the entrance requirements will qualify students for training. a = Graduation from accredited school of nursing; b = Graduation from accredited school of physical education; c = Two years of college with science courses; d = Three years of college with science courses.  
† For complete information regarding entrance to Army training schools write to Major Emma E. Vogel, Director of Physical Therapy Aides, Office of the Surgeon General, War Department, Washington, D. C.  
1. Male students admitted.  
2. High school graduates accepted for four-year course leading to A.B. degree; students admitted quarterly and tuition is \$143 per quarter.  
3. High school graduates admitted to regular course.  
4. Medical technology graduates with B.S. degree also admitted.  
5. Non-residents charged additional fee.  
6. Those with degree from any accredited college also accepted.  
7. Students with two years of college admitted to emergency course only.  
8. Reprinted in part with permission J. A. M. A. 124:918 (March 25) 1944.

# APPROVED SCHOOLS FOR OCCUPATIONAL THERAPY TECHNICIANS Council on Medical Education and Hospitals of the American Medical Association

Name and Location of School	College of Affiliation	Duration of Course	Classes Start	Entrance Requirements	Tuition Per Year	Certificate, Diploma, Degree	Graduates in 1943
University of Kansas, Lawrence.....	University of Kansas	4 yrs.	Every semester	High Sch.	Univ. fees	Degree	None
Boston School of Occupational Therapy, 7 Harcourt St., Boston .....	None	28 mos.	July-Oct	1 yr. coll.	\$300	Diploma	27
Kalamazoo State Hospital School of Occupational Therapy, Kalamazoo, Mich. ....	Western Michigan College of Education	25 mos.	Mar-Nov	1 yr. coll.	Coll. fees	Dipl. & B. S.	15
Michigan State Normal College, Ypsilanti.....	Michigan State Normal College and University of Michigan	3-4 yrs.	Every semester	High Sch.	\$67	Dipl. & Degree	None
St. Louis School of Occupational and Recreational Therapy, 4567 Scott Ave., St. Louis.....	Washington University	27 mos. 45 mos.	Sept Sept	2 yrs. coll. High Sch.	\$250 Univ. fees	Diploma Degree	13
Columbia University, 116th St. and Broadway, New York City....	Columbia University	27 mos.	Feb-Sept	1 yr. coll.	Univ. fees	Certificate	None
New York University School of Education, 100 Washington Sq. E., New York City.....	New York University	3½ yrs. 4½ yrs.	Varies Varies	1 yr. coll. High Sch.	\$450 \$450	Certificate Degree	4
Ohio State University, Columbus.....	Ohio State University	3 yrs.	Quarterly	High Sch.	\$100	Certificate	None
Philadelphia School of Occupational Therapy, 419 S. 19th St., Philadelphia .....	University of Pennsylvania	24 mos. 3½ yrs.	Varies Varies	1 yr. coll. High Sch.	\$300 \$600	Diploma B. S.	38
Richmond Professional Institute, 901 W. Franklin St., Richmond, Va. ....	College of William and Mary	3 yrs.	Feb-Sept	1 yr. coll.	\$200-\$220	Certificate	None
Milwaukee-Downer College Dept. of Occupational Therapy, 2512 E. Hartford, Milwaukee.....	Milwaukee-Downer College	3 yrs. 5 yrs.	Sept Sept	1 yr. coll. High Sch.	\$250 \$230	Diploma B. S.	25
Mount Mary College, 2900 Menomonee River Dr., Milwaukee.....	Mount Mary College	5 yrs.	Sept	High Sch.	\$230	B. S.	7
University of Toronto, Dept. of University Extension, Toronto, Ont., Canada.....	University of Toronto	3 yrs.	Sept	1 yr. coll.	\$175	Diploma	33



D. T. Watson  
School of Physical Therapy

*affiliated with*

University of Pittsburgh  
School of Medicine

Course in  
Physical Therapy

*For information address*

Jessie Wright, M. D.  
Sunny Hill, Leetsdale, Pennsylvania

*Course of*  
**PHYSICAL  
THERAPY**



**HOSPITAL FOR SPECIAL  
SURGERY**

321 East 42nd Street  
New York City 17

Dir.: K. G. Hansson, M.D.

**MOIST  
HEAT**

**SIMPLY AND CONVENIENTLY APPLIED  
BENTONITE COMPRESS**

- **LARGER SURFACE AREA**—adsorbs and holds 4 to 5 times its weight in water.
- **INORGANIC SUBSTANCE**—contains no earthy or organic material.
- **INDEFINITE USAGE**—can be used over and over again.
- **HYDRATES EASILY**—put compress in water and boil.
- **HOLDS HEAT LONGER**—low thermal conductivity.

**STOCK SIZES AVAILABLE**

6 x 10 inches	\$1.25	postpaid.
10 x 12 inches	2.00	

*Order a Supply Today*

**CHATTANOOGA PHARMACAL COMPANY**  
Chattanooga 3, Tennessee

**I. GREENWALD CO., INC.**

Manufacturers of complete line of Electro-Medical and Surgical Instruments and Accessories. Repair of all instruments.

Catalog on request.

2688 DeKalb Street      **GARY, INDIANA**

**BUY U. S.  
WAR BONDS**

**E & J RESUSCITATOR  
INHALATOR  
AND ASPIRATOR**

•  
The automatic breathing machine for the treatment of respiratory failure in adults, children or the new-born.

Employed in more than 1,000 clinics and many important industrials and first aid organizations.

•  
**E & J MANUFACTURING  
COMPANY**

**Glendale, California**

Drexel Building,  
Philadelphia

581 Boylston Street,  
Boston, Mass.

4448 West Washington Blvd.,  
Chicago 24, Ill.